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EPA Superfund
Record of Decision:

GREEN RIVER DISPOSAL, INC.
EPA ID: KYD980501076
OU 02
MACEO, KY
08/23/2000

GREEN RIVER DISPOSAL LANDFILL SUPERFUND SITE

RECORD OF DECISION
for
OPERABLE UNIT 2
(Groundwater)

U.S. Environmental Protection Agency
Region 4

August 23, 2000

GREEN RIVER DISPOSAL LANDFILL SUPERFUND SITE
OU 2 RECORD OF DECISION

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DECLARATION FOR THE RECORD OF DECISION

Site Name and Location

Green River Disposal Landfill (KYD980501076)
Kelly Cemetery Road
Maceo, Daviess County, Kentucky

Statement of Basis and Purpose

This Record of Decision presents the selected remedial action for Operable Unit 2 (groundwater) at the Green River Disposal Landfill site, located in Maceo, Daviess County, Kentucky. The remedial action selected conforms with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document is based on the information contained in the Green River Disposal Landfill Administrative Record.

The Commonwealth of Kentucky Department for Environmental Protection does not concur with the selected remedy.

Assessment of the Site

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Record of Decision, may present an imminent and substantial endangerment to public health and welfare.

Description of the Selected Remedy

Based on the Remedial Investigation, the Baseline Risk Assessment, and the Feasibility Study, the selected remedy is described as follows:

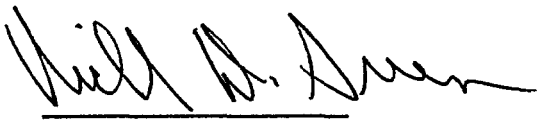
- Implementation of proprietary institutional controls (such as easements and/or covenants) prohibiting:
  1. construction of any type of structure on the 14 acre landfill cap; and,
  2. construction of any groundwater extraction well (including drinking water wells and irrigation wells) within the site boundary, defined by the perimeter fence.

- Development and implementation of a groundwater monitoring plan to evaluate the performance of the landfill cap and leachate collection system. This plan will be implemented as part of the routine operation and maintenance of the landfill (OU1).

Declaration

The selected remedy is protective of human health and the environment, attains Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy addresses groundwater which is not considered to be a source material, and therefore the statutory preference for treatment of principal threat wastes is not applicable.

Because this remedy will result in hazardous substances remaining on-site above health- based levels, a review will be conducted every five years after commencement of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.



23 AUG '00

Richard D. Green, Director
Waste Management Division

Date

1.0 BACKGROUND

1.1 Site Location

The site is located in Daviess County approximately 12 miles northeast of Owensboro, Kentucky, in the community of Maceo (Figure 1). The site is located within the Lewisport, Kentucky - Indiana USGS (United States Geological Survey) 7.5 Minute Topographic Quadrangle; its approximate coordinates are 37° 53' 30" latitude and 86° 58' 30" longitude.

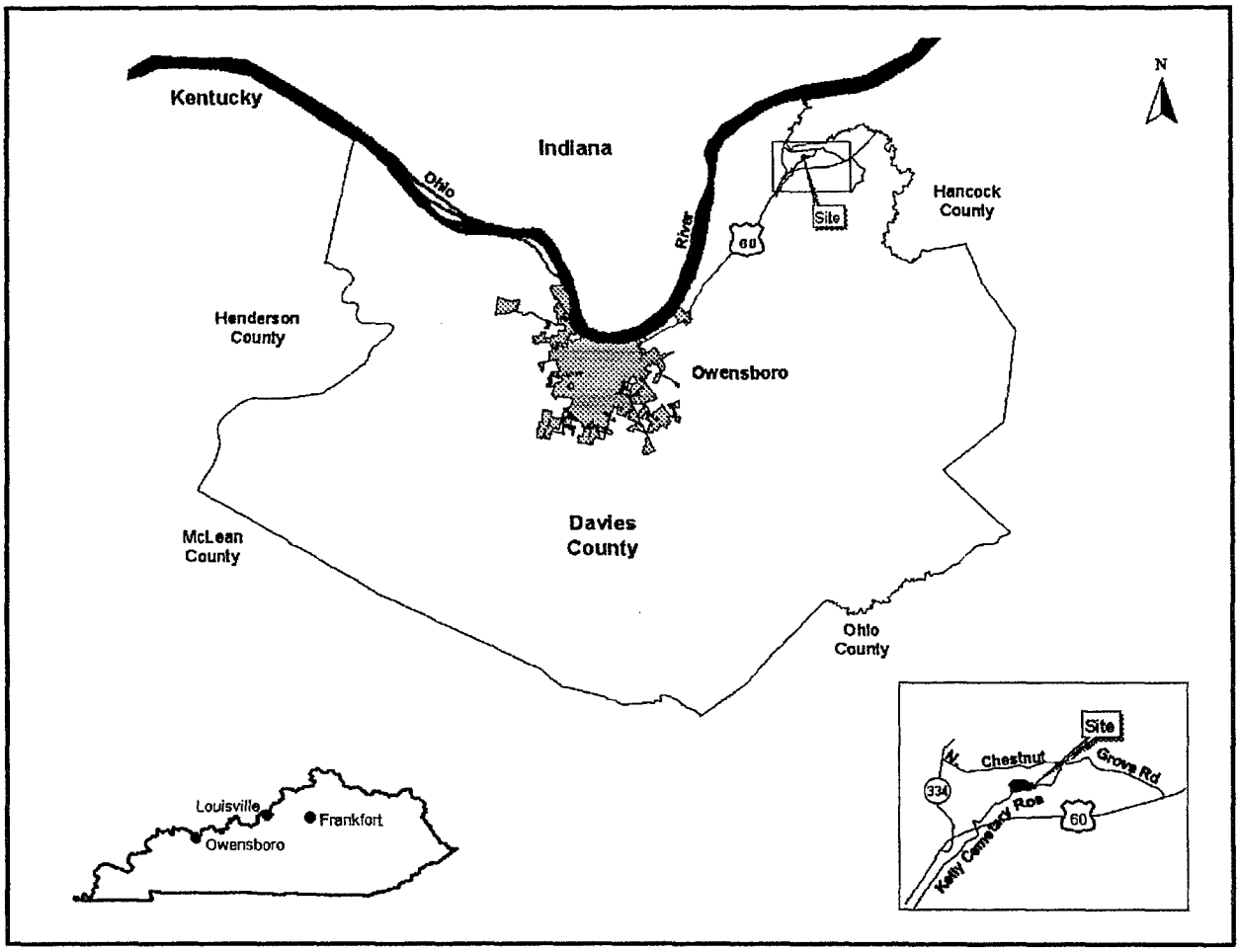


Figure 1: Site Location Map

1.2 Site Description

The Green River Disposal Landfill Site (site) is a 14-acre landfill formerly permitted by the state of Kentucky for disposal of municipal and industrial solid waste. Adjacent to the eastern property boundary of the Landfill is a 4-acre tract of undeveloped land where drummed waste had been dumped. The drums were removed in 1985 by the Kentucky Department for Environmental Protection (KDEP), and the area was investigated for soil contamination and possible buried drums during the Green River Landfill Remedial Investigation (RI). The investigation reveled that no soil contamination or buried drums were found in this area.

The topography of the area surrounding the site is characterized by knobs connected by long, narrow ridges and steep hillsides and ridge tops. The ridges and knobs are dissected by intermittent stream channels and small streams. Ground-surface elevations vary from about 550 feet (above the North American Geodetic Vertical Datum (NGVD)) on ridge tops to about 400 feet along the major valleys. The ridge and valley topography is bordered by the Ohio River floodplain, which is at an average elevation of about 390 feet NGVD.

Kelly Cemetery Road, located along a narrow ridge line, marks the southern border of the site. The topography slopes downward from Kelly Cemetery Road to the north where a narrow valley occupied by an unnamed intermittent tributary is located at the base of the landfill. Chestnut Grove Road is located on a ridge north of the unnamed tributary.

The unnamed tributary flows to the west into a sedimentation pond located topographically down gradient of the landfill outside of the Green River Disposal, Inc., property boundary but within the site boundaries as shown on Figure 2. The sedimentation pond is located on the Browning Ferries Industries (BFI) property and was designed and built as part of the State's landfill closure requirements. The sedimentation pond also receives drainage from other intermittent tributaries in the valley. The pond outfall continues west approximately 2000 feet where it meets Little Blackford Creek. Little Blackford Creek flows into Blackford Creek and then into the Ohio River. The travel distance of surface water flow from the site to the Ohio River is approximately 3 miles.

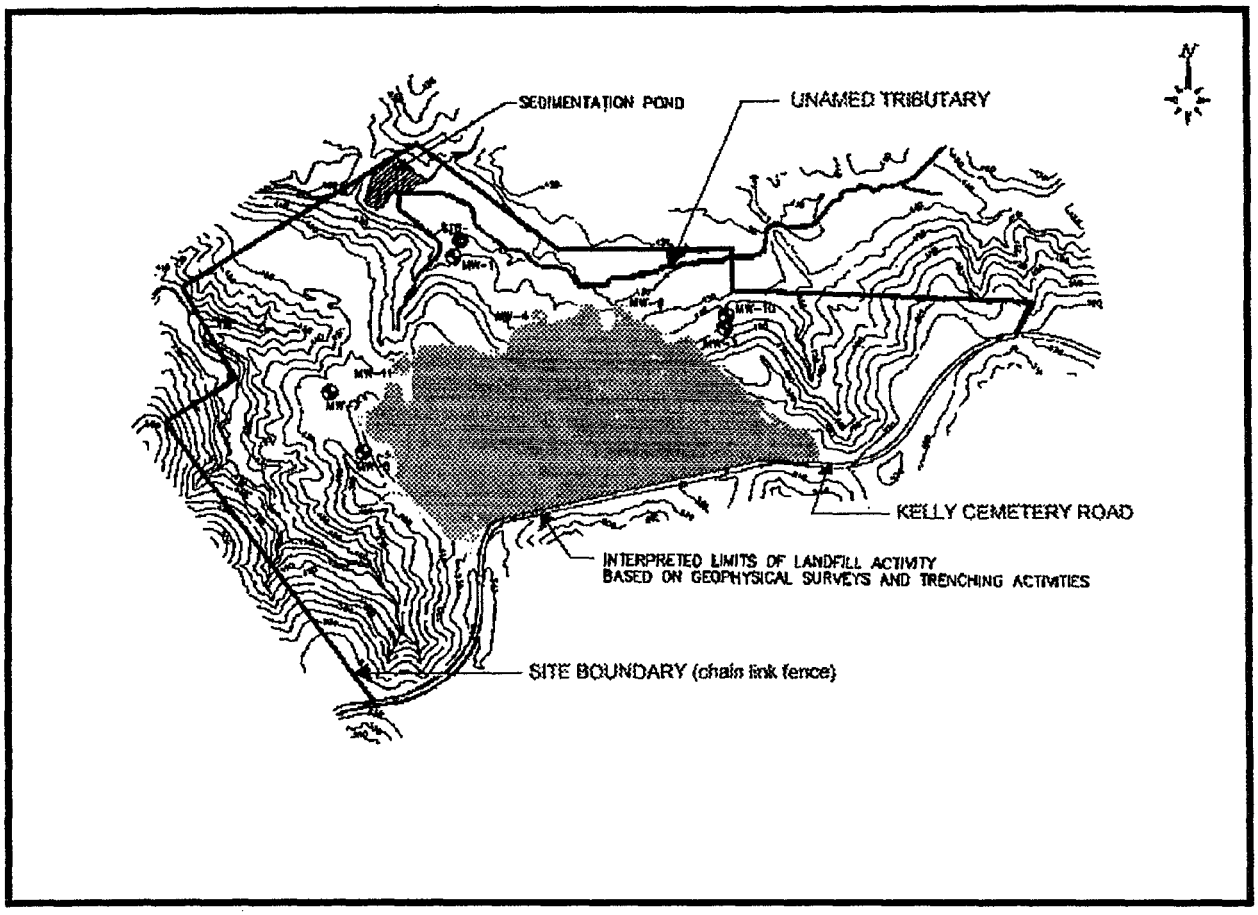


Figure 2: Site Map

The site is located in a watershed that occupies approximately 187 acres. Chestnut Grove Road follows the northern boundary of the watershed, and Kelly Cemetery Road marks the major portion of the southern boundary. Immediately west of the site, the watershed border diverges from Kelly Cemetery Road and follows a northwest ridge to Little Blackford Creek. The area of the watershed topographically upgradient of the sedimentation pond is approximately 114 acres. Figure 3 illustrates these features.

The western side of the landfill is comprised of a steep ravine with a northwest downward sloping axis. Although landfilling activities have not occurred in this area, isolated areas containing deteriorated empty drums and drum debris were removed from the land surface. The typical slope of the sides of the ravine range from 35 to 45 percent (%). The intermittent stream in the ravine flows off site to the northwest at a gradient of 7%.

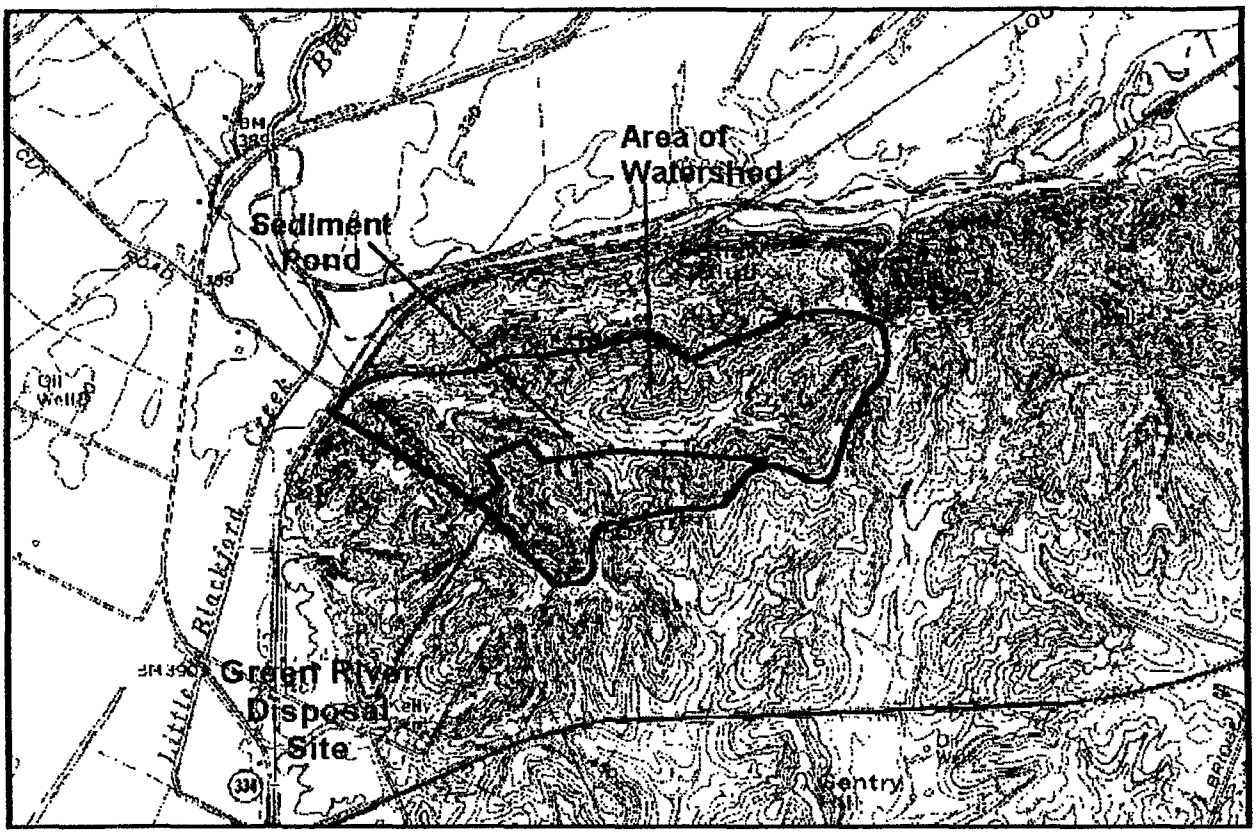


Figure 3: Surrounding Topography

The site is located in a sparsely populated area of Daviess County, near the town of Maceo. Land use in the site area ranges from undeveloped deciduous forests, farmland, to scattered residential development. Typical crops of the area include corn, soybeans, and tobacco. Some farms also include livestock.

Recreational activities in the area around the site include hunting, fishing, and dirt bike riding. The landfill area, portions of the unnamed tributary, and sedimentation pond are currently fenced, discouraging access for potential recreational activities in on the site.

1.3. Site History and Enforcement Activities

The Green River Disposal, Inc., Landfill was operated from 1970 to 1983. Initially the site contained two landfills, Reliable Sanitation Company, Inc., (also known as the W. D. Coleman landfill) and the Dyer Salvage Company, which were merged to form the landfill. An approximate 14-acre tract of land was authorized by the State to receive specific industrial wastes from numerous local companies. Table 1 is a partial list of the industrial wastes believed to be disposed of in the landfill. Because of the steep topography of the site, the waste was pushed into ravines and covered with soil.

The landfill was closed in 1983. During and after its operations, the landfill was investigated by the Kentucky Division of Waste Management (KDWM). In January 1983, the facility entered into an Agreed Order with the KDWM and a formal Closure Plan was submitted.

Industrial Wastes Contained in the Landfill

- *Spray Booth Paint Sludge*
- *Zink Phosphate Tank Bottom Sludge*
- *Cured Epoxy Resin*
- *Dried Paint Filter Waste*
- *Phenolic Resins*
- *Coagulated Latex*
- *Cresylic Acid*
- *Paintline Wastewater Treatment Sludge*
- *Aluminum Dross Saltcake*
- *Waste Rolling Oil*
- *Steel Dust*
- *Asbestos Containing Waste*
- *Pulverized Aluminum*

TABLE 1

A construction permit was issued on March 30, 1983 by the KDWM for a sedimentation basin. The construction date of the sedimentation basin/pond is unknown.

The landfill was evaluated for placement on the NPL in June 1987, by the KDWM which rated the site at 31.24 on the HRS scoring system. In response to comments received by the USEPA regarding the HRS scoring package, the final score was reduced to 29.12. The site was placed on the NPL in August 1990.

In 1985, KDWM removed 776 drums from the KCR Site located adjacent to the eastern property line of the landfill.

In 1990 Immediate Response activities were initiated through an Administrative Order (AO) issued by EPA to four PRPs. These activities included: residential well survey and sampling, construction of a security fence along the perimeter of the site, sampling and analysis of leachate, geophysical surveys of the landfill, construction of a temporary leachate control and collection system for the landfill, and installation of a temporary cover over the landfill.

An Administrative Order on Consent (AOC) between EPA and four Potentially Responsible Parties (PRPs) to conduct a Remedial Investigation (RI) and Feasibility Study (FS) was signed in May 1990. The RI field activities were initiated in October 1991, and the combined RI/FS was completed in June 1994. Construction of the Operable Unit 1 (OU1) remedy began in September 1996 and was completed in October 1997, by a group of ten Potentially Responsible Parties (PRPs) under a Unilateral Administrative Order issued by EPA.

2.0 COMMUNITY PARTICIPATION

A Community Relations Plan (CRP) was developed to establish a framework for community relations activities at the Green River Disposal Landfill Site. The Plan outlines the community relations program, which was designed to provide the public with: an opportunity to participate in the decision-making process; a mechanism to remain informed on planned and current site activities; and access to EPA so that the community can efficiently communicate their concerns. The CRP, dated November 6, 1990, was implemented throughout the Remedial Investigation and Feasibility Study (RI/FS) for OU1 and OU2, and is consistent with the requirements of CERCLA §113(k)(2)(B) and §117.

For activities related to OU2, EPA provided the local community group, the Green River Toxic Waste Cleanup Association, with copies of all technical reports as the reports were produced throughout the project. EPA met with the community group on two occasions to solicit input about the project. Information about the site was also provided to the public through the information repository and Administrative Record (AR) at the Owensboro Public Library, located in Owensboro Kentucky. The information repository included general information about EPA, the Superfund Program and site specific documents. The AR was established as an official record of all documents and information EPA used as a basis for developing the proposed final action.

In May 2000, EPA issued a proposed plan fact sheet for OU2 outlining the results of the groundwater study, feasibility study, and baseline risk assessment. The fact sheet also described EPA's proposed final remedy for the site and announced the public meeting and comment period. The Fact Sheet was sent to the local community, and to local, State, and Federal officials. The public comment period began on May 15, 2000 and ended on June 13, 2000. The attached responsiveness summary (Appendix A) outlines the comments received and EPA's response.

EPA conducted a public meeting on May 18, 2000 to discuss the findings of the investigation, to describe the proposed cleanup remedy, and answer questions concerning the site. Those in attendance at the meeting included concerned citizens, the Green River Toxic Waste Cleanup Association, a reporter from the Owensboro Messenger-Inquirer newspaper; representatives

from Green River Coordinating Group (Potentially Responsible Party); and representatives from the Commonwealth of Kentucky, Division of Waste Management. A transcript of the meeting is included in Appendix C.

3.0 SCOPE AND ROLE OF THIS RESPONSE ACTION

The cleanup strategy for the site was implemented in two phases, categorized as Operable Units 1 (OU1) and 2 (OU2). The OU1 Record of Decision addressed the landfill waste and all other contaminated media at the site, except groundwater. This OU2 ROD presents the selected remedial action for groundwater at the site. Each operable unit is described in more detail below.

Operable Unit 1

Construction of the Operable Unit 1 (OU1) remedy began in September 1996 and was completed in October 1997. The OU1 remedy included the following components: composite barrier landfill cap, leachate collection and treatment system; excavation of contaminated sediment and disposal within the landfill; and removal of surface debris along the perimeter of the site. The composite barrier cap is composed of a geosynthetic clay liner over a prepared subgrade, a 60 mil high density polyethylene (HDPE) liner, a geocomposite layer for drainage, then a 36 inch vegetative soil cover. The cap was designed to prevent storm water infiltration, minimizing production of leachate. The main component of the leachate collection system is the long underground collection trench, which was installed along the base of the landfill and into the bedrock. The trench intercepts leachate, which may be draining from the landfill and prevents contaminants from migrating into groundwater.

Operable Unit 2

This OU 2 ROD will address concerns regarding groundwater. The future effects of the landfill on groundwater have been mitigated by OU1. Current groundwater conditions may have been influenced by past releases from the landfill. The remedy selected for the groundwater (OU2) was chosen based on the results of the Remedial Investigation (including the supplemental groundwater study), Baseline Risk Assessment, Feasibility Study and all other documents and information contained in the Administrative Record. EPA makes this determination pursuant to the requirements of CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The selected remedy described in this ROD is intended to address groundwater conditions at the site that have been determined to present potential future human health risks. This OU2 ROD will address groundwater concerns only and will be the last and final ROD for this site.

4.0 SUMMARY OF SITE CHARACTERISTICS

4.1 Conceptual Site Model

The site is a 14-acre landfill constructed on a steep grade. The wastes were disposed on the existing land surface without a liner or barrier of any kind between the waste and the ground. None of the waste contained in the landfill, however, contacted groundwater. The wastes were graded and each successive layer of waste was covered with a small layer of soil as a temporary cover. At the time the landfill closed, a crude soil cover was placed over the top. Storm water seepage was a constant problem as evidenced by numerous leachate seeps at the base of the landfill. The known leachate seeps discharged at the base of the landfill and flowed overland to the unnamed tributary. It is plausible that leachate may have migrated to the underlying soil and shallow aquifer, but the geological and hydrological data indicates that any contaminated water (leachate or groundwater) that may surround the site flows to the bottom of the valley. The landfill waste is the only suspected potential source of groundwater contamination at the site.

The only potential unacceptable human health impact would result from ingestion of contaminated groundwater. No environmental risks are estimated, since there are no environmental receptors.

4.2 Hydrogeology

Hydrogeologic studies conducted at the site included: rock coring; soil test borings; drilling and monitoring well installation; downhole geophysical logging; hydraulic conductivity testing. Subsurface geologic information indicates that the lithologies present at the site were deposited in a fluvial depositional environment forming laterally discontinuous interlensing beds of siltstone, shale, and sandstone, interbedded with discontinuous beds and lenses of coal and limestone. A hydrogeological cross-section traversing the site from east to west is provided in Figure 4.

At the site, water within the vadose zone percolates through the soil horizon to the ground-water surface within the surficial aquifer. It appears that the ground water then flows to the north to discharge to the intermittent stream along the northern boundary of the landfill. Data from coring, air rotary drilling, and geophysical logging indicated that vertical flow of ground water is restricted. The core logs describe shale layers which likely act as an aquiclude or aquitard; the air rotary drilling within the bedrock penetrated distinct water bearing zones followed by dry zones; and the geophysical logging of the borings also detected potential distinct

isolated moist zones within the bedrock indicating that the surficial aquifer is isolated from the lower aquifer. Additionally, in-situ slug testing within the monitoring wells revealed that hydraulic conductivity values decrease with depth. The logarithmic average of the hydraulic conductivities was 6.6 x 10^{-3} ft/min in the residual soil and weathered bedrock zone, 1.9 x 10^{-4} ft/min in the shallow bedrock zone, and 1.2 x 10^{-6} ft/min in the intermediate bedrock zone. Horizontal ground-water flow mimics the topography and is the dominant ground-water flow path. A potentiometric surface map of the ground-water elevations is shown in Figure 4.

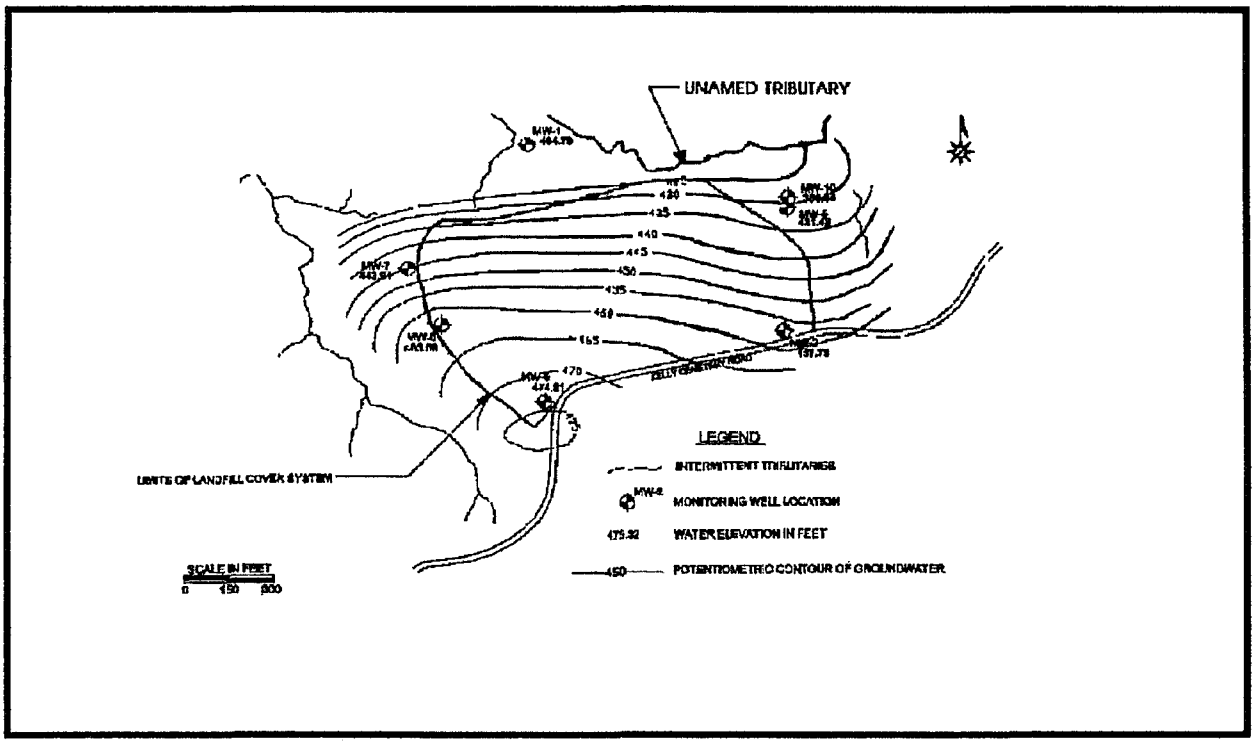


Figure 4: Groundwater Gradient

4.3 Groundwater Monitoring results and Contaminants of Concern (COCS)

During the Remedial Investigation, 11 monitoring wells were installed around the perimeter of the landfill. These wells were used to collect representative groundwater samples to determine if landfill contaminants were present in the groundwater at the site. The samples were analyzed for a complete list of organic and inorganic compounds.

The laboratory data was evaluated and used to determine actual and potential human health and ecological exposure risks. Certain chemicals present. in those samples were identified as Contaminants of Concern (COCs), which may pose an unacceptable potential human health risk. The compounds identified were: **barium, beryllium, cadmium, and manganese.**

A supplemental groundwater study was initiated after construction of the OU1 remedy and consisted of sampling 7 of the 11 original monitoring wells. Four of the monitoring wells used during the initial investigation were removed during construction of the landfill cap. Groundwater samples from all of the remaining wells were collected during two separate sampling events. The samples were analyzed for the four COCs identified (total concentrations and dissolved), total suspended solids and ammonia (a landfill contaminant).

The results of the supplemental groundwater study show that the levels of the four COCs did not change significantly between sampling events. However, the concentrations between monitoring wells varied significantly. No contamination plume was evident. Additionally, the groundwater wells where the COCs were found did not produce much water when pumped.

The concentrations of COCs observed in the groundwater were compared to concentrations of the same compounds found in underlying rock formations present in the area of the site. Several independent studies by the United States Geologic Survey and the Kentucky Geologic Survey indicate that the COCs are prevalent in the area soils, sediments and subsurface rock. Additionally, the Kentucky Geologic Survey found that manganese is a common, naturally occurring element in Daviess County drinking water.

Table 2

COCs	Range of Concentrations found in the Groundwater (μg/l)[1]		Drinking Water Standard (MCLs, μg/l)[4]
	Dissolved[2]	Total[3]	
Barium	59.4 - 2,470	64.3 - 2,400	2,000
Beryllium	0.30	0.30 - 6.5	4
Cadmium	1.5 - 24.7	0.3 - 22.7	5
Manganese	0.60 - 11,400	2.5 - 12,400	50[5]

[1]Maximum concentrations found in groundwater;
[2]Dissolved concentration of filtered water sample;
[3]Total concentration of unfiltered water sample;
[4]National Primary Drinking Water Regulations, Maximum Contaminant Levels (40CFR§141)
[5]Secondary MCL, promulgated for aesthetic reasons, not health related.

4.4 Groundwater Study Conclusions

Based on a careful evaluation of the groundwater data, and on data collected at the site during the remedial investigation, it appears that no significant release of hazardous constituents has occurred at the site. The conclusions of the groundwater investigation are outlined as follows:

- The contaminants of concern (COCs) appear randomly in groundwater across the site and at different depths. There is no evidence of a concentrated, discrete plume of contamination at the site.

- People are not currently exposed to groundwater from the site and it is expected that future exposures will be unlikely because groundwater at the site has limited use or value as a source of drinking water. The surrounding community obtains its water from a municipal water supply system. The following section (Section 4.5) provides additional information related to this issue.

- The COCs have been documented to exist naturally in the rock formations present at the site. Although the groundwater data did not conclusively show that the concentrations of COCs are naturally occurring, or that the COCs could have been released from the landfill waste, several independent studies by the U.S. Geologic Survey and the Kentucky Geologic Survey confirm the common occurrence of the COCs in the surrounding area.

- Landfill waste samples showed that the levels of COCs relative to background soil, were not elevated, which indicates that the landfilled mass may not potentially be a source of the COCs. Barium and manganese were also found in background surface water at concentrations consistent with levels found in groundwater.

- The remedy constructed for the landfill (OU1) has contained leachate and is protecting groundwater from any further contamination. The multi-layer landfill cap and leachate collection and treatment system minimizes any potential future release of contaminants from the wastes into the groundwater.

- Most of the COCs detected were at concentrations below EPA's primary drinking water standards. Barium and beryllium exceeded primary drinking water standards (MCLs) only once in two separate wells. Cadmium was found to exceed its MCL in four of the seven wells. Manganese was found in all wells, but no health based primary drinking water standard exists for this element.

4.5 Current and Potential Future Land and Groundwater Use

The total area encompassed by the site boundary (within the site fence) is approximately 50 acres. The land immediately adjacent to the site on all sides is currently undisturbed wooded land. The topography is steeply sloped to the valley below. The site and adjacent properties are not currently being used for any purpose. However, the land in the vicinity of the site is currently used primarily for residential and farming. There are currently no potable wells on the site or in the immediate vicinity.

The potential future use of the site is somewhat limited by the topography of the land. Because of the steep nature of the land, it is unlikely that a large part of the property can be used for residential or farming purposes. However, in the valley below the landfill the land is flat and potentially suitable for building a residence or small farm. A small parcel of land located topographically and hydraulicly downgradient of the site in the valley, was used at one time for a residence. The house was removed over ten years ago and now the property is not currently used, although a barn has been erected.

Potential future groundwater use for drinking water is unlikely because the area surrounding the site is serviced by a municipal water supply company. Additionally, the aquifer at the site has limited beneficial use because it has poor yield and limited specific capacity.

5.0 SUMMARY OF SITE RISKS

A Baseline Risk Assessment (BRA) was performed to estimate the potential human health and environmental impacts, if contaminated groundwater at the site were not remediated. The BRA, presented in Section 6.0 of the Remedial Investigation Report provides estimates of potential human health risks based on information acquired during the RI. This section of the ROD summarizes the results of the BRA and identifies the contaminants and exposure pathways that need to be addressed by the remedial action.

5.1 Summary of Human Health Risks

5.1.1 Constituents of Concern

The constituents of concern for groundwater identified in the remedial investigation are: barium, beryllium, cadmium, and manganese. Table 2 in section 4.3 shows the range of detected concentrations for the COCs in groundwater.

5.1.2 Exposure Assessment

The purpose of an exposure assessment is to provide an evaluation of the potential for human exposure to constituents at a site in the absence of a remedial action. The exposure assessment incorporates data that identify the COCs and their potential transport through the environment. The assessment identifies potential exposure pathways and receptors associated with a site in order to identify potential human or environmental risks associated with the site.

No current exposure to humans exists for groundwater, since there are no drinking water supply wells on-site, or down gradient wells off-site. Based on the conceptual site model outlined in section 4.1, a potential future human exposure to groundwater is possible if a resident were located on the site in the valley below the landfill. A risk assessment was performed assuming a conservative residential exposure scenario. The routes of exposure are ingestion (drinking water), and dermal contact. The population exposed would be a residential adult and child.

Exposure point concentrations for the future groundwater use scenario are based on the results of the monitoring well data from sampling locations on-site. The future groundwater exposure point concentrations are assumed to be equal to the 95 percent upper confidence limit (UCL) on the arithmetic mean of concentrations in monitoring wells sampled. When the 95 percent UCL exceeded the maximum concentration, then the maximum concentration of the constituent was used as the exposure point concentration.

5.1.3 Toxicity Assessment

This section presents the available toxicity values which were used for the COCs at the site. Toxicity values are not available for all the constituents detected. Lack of toxicity data may cause risks to be underestimated. In accordance with EPA guidance, constituent which lack toxicity values are evaluated qualitatively and the absence of toxicity values is identified as an uncertainty. Uncertainties also arise because toxicity values are often based on data extrapolated from other species.

Table 3

Toxicity Data Summary Ingestion of Groundwater				
COCs	Oral Slope Factor	Units	Weight of Evidence	Source
Barium	no data	kg-day/mg	NA	IRIS
Beryllium	4.3E+00	kg-day/mg	B2	IRIS
Cadmium	no data	kg-day/mg	B1	IRIS
Manganese	no data	kg-day/mg	D	IRIS

Notes: NA: Not Available
Slope factors: Unit Risk (L/Fg)*1,000Fg/mg * day/2L * 70kg = CSF (kg-day/mg)
B1: Probable human carcinogen; limited human data available
B2: Probable human carcinogen; inadequate or no evidence in humans
D: Not classafiable as to human carcinogenicity
IRIS: Integrated Risk Information System (6/93)

Table 4

Toxicity Data Summary Ingestion of Groundwater					
COCs	Chronic RfD	Units	Confidence Level	Uncertainty Factor	Source
Barium	7E-02	mg/kg-day	medium	3	IRIS
Beryllium	5E-03	mg/kg-day	low	100	IRIS
Cadmium	5E-04	mg/kg-day	NA	NA	IRIS
Manganese	5E-03	mg/kg-day	NA	NA	IRIS

Notes: Confidence Level (low, medium, or high) as reported in IRIS

5.1.4 Carcinogenic and Noncarcinogenic Risk Characterization

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen. Excess lifetime cancer risk is calculated from the following equation:

Risk = CDI x SF

where: Risk = a unitless probability (e.g., $2x10^{-5}$) of an individual developing cancer
CDI = chronic daily intake averaged over 70 years (mg/kg-day)
SF = slope factor, expressed as $(mg/kg\text{-}day)^{-1}$

These risks are probabilities that usually are expressed in scientific notation (e.g., $2x10^{-5}$). An excess lifetime cancer risk of $1x10^{-6}$ indicates that an individual experiencing the reasonable maximum exposure estimate has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure. This is referred to as an "excess lifetime cancer risk" because it would be in addition to the risks of cancer individual face from other causes such as smoking of exposure to too much sun. The chance of an individual's developing cancer from all other causes has been estimated to be as high as one in three. EPA's generally acceptable risk range for site-related exposures is 10^{-4} to 10^{-6}.

The excess cancer risk estimated for a potential future resident via ingestion, was 9×10^{-4} and was primarily attributed to the presence of beryllium in turbid samples collected from four on-site ground-water monitoring wells. Estimated risk for the dermal contact route was 2×10^{-6}. Beryllium was detected in site background soil samples and is commonly present in shale within Kentucky. Its presence in the turbid samples may be the result of naturally occurring beryllium. Turbid samples were collected despite the use of low-flow sampling techniques which should have minimized turbidity.

The potential for noncarcinogenic effects is evaluated by comparing as exposure level over a specified time period (e.g., life-time) with a reference dose (RfD) derived for a similar exposure period. An RfD represents a level that an individual may be exposed to that is not expected to cause any deleterious effect. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ less than 1 indicates that a receptor's dose of a single contaminant is less than the RfD and that toxic noncarcinogenic effects from that chemical are unlikely. The Hazard Index (HI) is generated by adding the HQs for all chemicals of concern that affect the same target organ (e.g., liver) or that act through the same mechanism for action within a medium of across all media to which a given individual may reasonably be exposed. An HI less than 1 indicates that, based on the sum of all HQ's from different contaminants and exposure routes, toxic noncarcinogenic effects from all contaminants are unlikely. An

HI greater than 1 indicates that site-related exposures may present a risk to human health. The HQ is calculated as follows:

Non-cancer HQ = CDI/RfD

where: CDI = Chronic daily intake
RfD = Reference dose

CDI and RfD are expressed in the same units and represent the same exposure period (i.e, chronic, subchronic, or short-term)

Hazard indices for the ingestion route exceeded the departure point of one. The hazard indices for future residential adults and children were 30 and 200, respectively. The majority of the risks are associated with one constituent, manganese.

5.1.5 Uncertainties of the Risk Assessment

The risks estimated assumed that residents would be drinking water with constituents at levels equal to those currently found on the site. This estimate is highly conservative since it is unlikely that the site would be used for a residence because of it's topography. Furthermore, the site and surrounding neighborhood is serviced by a municipal water supply system, thereby eliminating the need for a potable water supply well.

The groundwater study outlined that the COCs encountered in the groundwater may be naturally occurring.

5.2 Ecological Risks

Ecological risks were not evaluated for groundwater since no routes of exposure exists. However, based on the hydrogeological analyses conducted, the groundwater is believed to follow the natural topography and drain to the floor of the valley. During certain times of the year, the groundwater may recharge the sedimentation pond and unnamed tributary. The sedimentation pond is routinely monitored as part of the operation and maintenance of the landfill and the results indicate that the COCs were significantly lower than Kentucky's ambient water quality criteria. It was concluded that any ecological risks associated with the potential exposure of groundwater COCs via surface water is non-existent.

6.0 DESCRIPTION OF REMEDIAL ALTERNATIVES

The Feasibility Study (FS) for OU2 considered a limited number of remedial alternatives consistent with EPA's policy to streamline the assessment and selection of remedies appropriate for particular types of sites (Presumptive Remedies). Based on the characteristics of the site, only a few reasonable remedies were appropriate for consideration. A description of the alternatives evaluated in the Feasibility Study and a summary of the comparative analysis of EPA's primary balancing criteria is presented in the following sections.

6.1 Remedial Action Objective (RAO)

Based on the characteristics of the site, nature of the contaminants of concern present and on the Baseline Human Health Risk Assessment, which identifies ingestion and dermal contact as the only exposure route, the remedial action objective established for the site is as follows:

> **Prevention of on-site exposure to humans through ingestion or dermal pathways of potentially impacted on-site groundwater.**

6.2 Description of Remedial Alternatives

Four remedial alternatives were evaluated to address the Remedial Action Objective (RAO):

Alternative 1: No Action

This alternative will not require any action to be taken, and the groundwater at the site will remain unchanged. Since no active response will be undertaken and no provisions will be provided to prevent potential human exposure to groundwater, this option will not meet the RAO. The potential risk identified in the risk assessment will not be reduced if this alternative is selected. This alternative serves as a baseline for comparison with other actions.

Alternative 2: Institutional Controls

This alternative involves placing legal restrictions on the property to prohibit installation of groundwater supply wells for human consumption and for agricultural purposes (i.e., irrigation). Engineering controls, such as perimeter fencing, are already in place. This alternative will include establishing deed restrictions (easements or covenants) that will provide for the following:

- Prevent human exposure to on-site groundwater by prohibiting construction of on-site water supply wells, including irrigation wells;

- Protect the landfill cap and leachate collection system by prohibiting construction of any type on the landfill cap or within 50 feet of the cap. This will ensure that the integrity of the cover system will remain intact and continue to protect groundwater from a release of leachate.

This remedy will prevent the potential for humans to be exposed to on-site groundwater and therefore, meet the RAO.

Alternative 3: Groundwater Quality Monitoring

This alternative includes collecting and analyzing groundwater samples for the COCs on a periodic basis. The monitoring would confirm the continuing performance of the OU1 remedy and also assess any changes to the condition of the groundwater. This alternative would continue until no further changes in groundwater quality are observed over a five year period, or negative changes in groundwater quality would require a response action.

Alternative 4: Groundwater Extraction and Treatment

This alternative involves pumping contaminated groundwater to the existing on-site leachate treatment facility. The groundwater would be treated in the same process as the leachate and discharged into the on-site unnamed tributary. No modifications to the treatment facility would be necessary to treat the groundwater.

Some limiting engineering issues with groundwater extraction and treatment exists, such as: 1) the sporadic occurrence and distribution of inorganic compounds in groundwater due to varying lithologies at the site; and 2) the ability to design a functional extraction system given the hydrogeologic restrictions that can effectively remove and/or contain the sporadic occurrence of the groundwater COCs. Given the inherent difficulties of restoring groundwater and the low-mobility nature of the COCs, groundwater extraction and treatment would not be an effective or efficient response. This alternative was eliminated as a potential remedy from further consideration in the feasibility study.

6.3 Comparative Analysis of landfill Alternatives

The NCP (National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR §300) requires a comparison of the remedial alternatives to nine specific criteria to determine which alternative is best. Table 5 outlines the nine criteria and the following narrative summarizes the comparative analysis performed in the feasibility study.

Overall Protectiveness

In terms of preventing direct contact with the COCs in on-site groundwater, alternatives 1 and 3 would not provide adequate protection, since there would be no restrictions on groundwater usage. None of the alternatives reduce or control the inorganic constituents, but Alternative 2 eliminates the future potential for human exposure.

Compliance with ARARs

For purpose of comparison, the three alternatives were evaluated in the Feasibility Study on the ability of each to meet regulatory standards or requirements (Applicable or Relevant and Appropriate Requirements (ARARs)). The standards in this case are the Maximum Contaminant Level Goals (MCLGs) for drinking Water Act. The NCP establishes MCLGs (or as an alternate standard Maximum Contaminant Levels, MCLs) as a cleanup threshold for groundwater that is a potential source of drinking water if the MCLG is relevant and appropriate to the circumstances of the release (40 CFR §300.430(e)(2)(i)). However, because of the circumstances at this site, EPA has concluded that MCLGs and/or MCLs are not appropriate standards to base a cleanup remedy upon and therefore are not an ARAR. This conclusion is based on the following:

Table 5

Nine Criteria for Evaluating Remedial Alternatives

1. **Overall Protection of Public Health and Environment:** Degree to which the remedy eliminates, reduces, or controls health and environmental threats through treatment, engineering methods or institutional controls.
2. **Compliance with State and Federal Requirements:** Degree to which each alternative meets environmental regulations determined to be applicable or relevant and appropriate.
3. **Short-term Effectiveness:** Length of construction period and the risks posed to workers and nearby residents during construction.
4. **Long-term Effectiveness:** Ability of a remedy to maintain protection of health and environment after the remedy is complete.
5. **Reduction of Mobility, Toxicity and Volume:** Degree to which the remedy reduces: the ability of contaminants to move through the environment: harmful nature of the contaminants; and, amount of contamination removed.
6. **Implementabillity:** Refers to the technical feasibility and administrative ease of implementing a remedy.
7. **Cost:** Benefits of a remedy are weighed against its cost.
8. **State Acceptance:** Consideration of the State's comments and acceptance of the preferred remedy.
9. **Community Acceptance:** Consideration of the public's comments and acceptance of the preferred remedy.

The groundwater at the site is not a potential source of drinking water. Subsurface lithologies at the site (laterally discontinuous beds of siltstone, shale, and sandstone, interbedded with discontinuous beds and lenses of coal, and limestone) limit the usefulness of the aquifer by providing poor yield and limited specific capacity. Groundwater data collected during the remedial investigation indicates that the aquifer at the site cannot sustain a production rate of 150 gallons per day. According to Federal Groundwater Classification Guidelines (EPA Groundwater Protection Strategy), the groundwater at the site is considered a Class III groundwater because it cannot yield sufficient water to meet the needs of an average family. Class III groundwater is not considered to be a potential source of drinking water and it has a limited beneficial use. Site specific data also indicate that vertical flow of groundwater is restricted. Core logs show that shale layers found at the site likely act as an aquiclude or aquitard.

Short-Term Effectiveness

All three Alternatives do not pose a short-term risk to human health, assuming no site development occurs.

Long-term Effectiveness and Permanence

Institutional Controls (Alternative3) would provide permanent protection and long-term effectiveness with respect to human exposure. The no-action alternative and monitoring alternative could not provide effective long-term protection of human exposure since no assurance can be provided that potable wells will be installed. The OU1 remedy, will continue to provide long-term protection of the groundwater.

Reduction of Toxicity, Mobility, or Volume

The toxicity, mobility and volume would not be reduced by implementing any of the alternatives considered. However, to the extent that the COCs are from the landfill, rather than from naturally occurring sources, the OU1 remedy will protective of the groundwater in terms of future toxicity, mobility and volume of COCs.

Implementabily

All three alternatives are technically or administratively implementable. The placement of deed restrictions on the property may present some difficulties because of property ownership issues, but there does not seem to be any legal obstacles that are unfeasible.

Cost

The no-action alternative (Alternative 1) has no capital or operation and maintenance costs. Alternative 2 involves only administrative costs (legal fee) to implement and is estimated at $23,000. The cost estimate for alternative 3 includes costs for groundwater monitoring for a five year period. The present worth cost (5 years @ 5% discount) for this alternative is $108,238.

State Acceptance

The Kentucky Department for Environmental Protection (KDEP) assisted EPA in reviewing all technical reports produced during the RI and FS. While the KDEP agrees that the selected remedy is necessary and appropriate, they do not agree with the characterization of the groundwater and have concerns about potential off-site migration of the COCs. KDEP recommends installation of monitoring wells off-site to show that contamination has not and will not migrate off-site.

Furthermore, the Commonwealth of Kentucky established a policy to preserve, protect and restore groundwater within the state, regardless of classification or circumstance (KRS 224.01-010; KRS 224.70-100 and KRS 224.70-110). This policy establishes that all groundwater is a potential public water resource, and as such, any contaminated groundwater should be restored. Therefore, KDEP does not concur with the selected remedy for OU2.

EPA does not believe that the condition of the site's groundwater warrant concerns about off-site migration, especially considering that the COCs may be naturally occurring and do not migrate through the groundwater well.

Community Acceptance

The local Maceo community organized a group of concerned citizens to monitor the progress of EPA's investigation and cleanup of the site. This group, called the Green River Toxic Waste Cleanup Association, is very involved at the site and has actively participated in the remedy selection process.

Based on the comments provided by the group at the Proposed Plan Public Meeting, EPA believes that the community agrees that the selected remedy may be appropriate but does not support the selection of the remedy at this time. The community group is concerned that leachate volumes have not decreased in the last two consecutive years, and this may indicate a problem with the landfill cap. They recommend that a decision concerning groundwater be postponed until a clear understanding of the leachate volumes is achieved.

EPA does not believe that the steady leachate volumes indicate a problem with the landfill cover system. The leachate produced by the landfill is being properly managed and any problems with the cover or leachate collection and treatment system that may be discovered will be addressed as part of the operation and maintenance of the landfill. EPA does not believe that issues regarding the leachate collection system should preclude making a decision concerning groundwater at this time.

6.4 Principal Threat Wastes

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP §300.430(a)(1)(iii)(A)). In general, principal threat wastes are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. Contaminated groundwater is not considered to be a source material, and therefore, no principal threat wastes are addressed by this ROD.

7.0 THE SELECTED REMEDY

7.1 Summary of the Rationale for the Selected Remedy

Based on the Remedial Investigation, Baseline Risk Assessment, Feasibility Study and on consideration of the requirements of CERCLA and the NCP (including the nine evaluation criteria), EPA has determined that the most appropriate remedy to mitigate the potential future human health risks associated with exposure to groundwater at the Green River Disposal Landfill site is implementation of institutional controls (Alternative 2). In addition, EPA will require groundwater monitoring for purposes of determining the performance of the landfill cover and leachate collection system. This monitoring will be conducted as part of the routine operation and maintenance responsibilities for the landfill (OU1) remedy. This remedy is selected after careful consideration of the circumstances and characteristics of the groundwater at the site. The groundwater conclusions used to select the remedy are as follows:

- The contaminants of concern (COCs) appear randomly distributed in groundwater across the site and some are intermittently detected between sampling events. Levels exceeding the MCL standard also appear sporadically between sampling events. There is no evidence of a concentrated, discrete plume of contamination at the site.

- People are not currently exposed to groundwater from the site and it is expected that future exposures will be unlikely because groundwater at the site has limited use or value as a source of drinking water. Monitoring wells at the site produced very little water. The surrounding community obtains its water from a municipal water supply system.

- The COCs have been documented to exist naturally in the rock formations present at the site. Although the groundwater data did not conclusively show that the concentrations of COCs are naturally occurring, or that the COCs could have been released from the landfill waste, several independent studies by the U.S. Geologic Survey and the Kentucky Geologic Survey confirm the common occurrence of the COCs in the surrounding area.

- The remedy constructed for the landfill has contained leachate and is protecting groundwater from any future contamination.

7.2 Documentation of Significant Changes

A Proposed Plan Fact Sheet was released for public comment in May 2000. The plan identified Alternative 2 (deed restrictions without monitoring) as the preferred remedy. At the public meeting the State and the Cleanup Association raised concerns about off-site migration of the COCs and concerns about leachate escaping from the landfill. In response to these concerns, EPA decided to add a groundwater monitoring component to the remedy. Although groundwater monitoring was an alternative considered during the feasibility study, the added component of the remedy is different since its purpose is to evaluate the performance of the landfill cover system. EPA believes that the added monitoring component will be less comprehensive than the original monitoring alternative considered. This change to the preferred remedy was discussed during the public meeting on May 18, 2000.

7.3 Description of the Selected Remedy

The selected remedy is described as follows:

A property easement or covenant shall be implemented to provide for the following:

- Prohibit construction of any on-site water supply wells and/or irrigation wells;

- Prohibit construction of any type on the landfill cap or within 50 feet of the cap. To ensure that the integrity of the cover system will remain intact and continue to protect groundwater from a release of leachate, these restrictions will also include prohibition of any activities on the landfill cap that may damage, alter in any fashion (such as planting ornamental landscaping) or otherwise be detrimental to the landfill cover system.

Groundwater on-site shall be monitored as part of routine operation and maintenance of the landfill to determine the performance of the landfill cover and leachate collection system (OU1). The data will be used to detect changes in the condition of the groundwater that may indicate a problem with the landfill cover system. A groundwater monitoring plan shall be submitted to EPA for review and approval, containing the following elements:

- Constituents to be analyzed will include the four COCs and other compounds or elements determined to be necessary to monitor. the performance of the cover system.

- The monitoring locations and sampling frequency shall be outlined in the monitoring plan. The sampling frequency shall be determined to provide sufficient data for establishing groundwater trends that may be used to show a potential problem with the cover system. For reasons outlined in this ROD, the groundwater data will not be used to monitor groundwater quality for compliance with MCLs.

- Leachate and the leachate collection system will also be monitored to ensure that groundwater is not being impacted. Leachate must be analyzed for the groundwater COCs and for constituents characteristic of the landfill contents. Data related to the performance of the leachate collection system shall also be obtained and evaluated on an annual basis.

It is expected that the existing engineering controls, such as the perimeter fence, will continue to be operational and maintained as part of the routine maintenance activities for the landfill.

For the purposes of this Record of Decision, the Green River Disposal Landfill site is defined as the area within the perimeter fence.

7.4 Summary of the Estimated Remedy Costs

The estimated costs for implementing Alternative 3 consists of only administrative costs (legal fees) and is estimated to be $23,000. Groundwater monitoring costs cannot be provided since details of the landfill (OU1) monitoring plan are not specified in this ROD.

7.5 Expected Outcomes of the Selected Remedy

EPA expects that the remedy will be implemented within one year of this Record of Decision. Potentially difficult property ownership issues are not expected to impede the implementation of this remedy. This remedy, along with the existing engineering controls (landfill cap, leachate collection and treatment system, and perimeter fence), will provide the best protection possible for human exposure to on-site groundwater.

As a result of this remedy, the property deed will restrict the use of the site to protect the landfill cap and therefore the groundwater; and also, ensure that groundwater on-site is never used for drinking.

It is expected that the landfill (OU1) monitoring plan will provide the data necessary to help evaluate the performance of the landfill cover and leachate collection system. After a full five

years of monitoring, EPA will determine whether to discontinue the monitoring plan or modify the plan based on the Five Year Review conducted.

8.0 STATUTORY DETERMINATIONS

8.1 Overall Protection of Human Health and the Environment

The selected remedy will provide the best overall protection to human health and the environment by:

- Preventing / eliminating direct human exposure of groundwater
- Preventing / eliminating activities that are detrimental to the integrity of the landfill cover system, and therefore, further protecting groundwater from a potential future landfill release.

Implementation of the selected remedy will reduce the excess human health risks estimated for in estion and dermal contact of on-site groundwater. The selected remedy meets the NCP's required threshold criteria for protection of human health and the environment.

8.2 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

EPA determined that the Federal Drinking Water Regulations (maximum contaminant levels) were relevant, but not appropriate to the circumstances at the site (see Section 6.3 Comparative Analysis of Landfill Alternatives). The remedy will not meet the Common Wealth of Kentucky's policy for restoration of groundwater for potable use (KRS 224.01-010; KRS 224.70-100 and KRS 224.70-110).

8.3 Cost Effectiveness

The remedy selected provides the best proportion of costs to overall protection of human health. The cost of the selected remedy is estimated to be less than half of the monitoring alternative and provides better protection of human health than the other two alternatives considered.

8.4 Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The National Contingency Plan (NCP) establishes a preference for selecting permanent remedies that utilize treatment to the maximum extent practicable. The selected remedy will establish permanent restrictions on the use of on-site groundwater, in lieu of treatment. Treatment was considered as an alternative, but was eliminated from further consideration because of its limited feasibility.

8.5 Five Year Review Requirements

The NCP (§300.430(f)(4)(ii)) requires a review of the remedy every five years if the remedial action results in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure. Because this remedy will result in hazardous substances remaining on-site, EPA will conduct a statutory review of the remedy every five years. Since the OU1 ROD was published approximately five years prior to this OU2 ROD, the first five-year review will only consist of an evaluation of the OU1 remedy. Every subsequent five-year review should consist of an evaluation of both the OU1 and OU2 remedy.

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

1.0 OVERVIEW

EPA established a 30 day public comment period for the Green River Disposal Site OU2 proposed remedy from May 15 to, 2000 through June 13, 2000. The purpose of the comment period was to request public input concerning EPA's recommended cleanup remedy for the site. The public comment period was initiated through the Proposed Plan Fact Sheet (sent to concerned citizens and local officials on EPA's mailing list) and through a notice placed in the local newspaper. A public meeting mas held on May 18, 2000 to discuss the results of the remedial investigation and formally present EPA's recommended remedy for the site. The meeting was held at the Maceo Volunteer Fire Department firehouse, in Maceo, Kentucky. EPA representatives responded to comments and questions from the local community at the meeting. A transcript of the meeting is included with this document in Appendix B.

Based on the comments provided by the Green River Toxic Waste Cleanup Association (Cleanup Association) at the public meeting, EPA believes that the Cleanup Association does not support EPA's proposed remedy at this time. The Cleanup Association's concerns were primarily related to the leachate collection system and the fact that the volume of leachate has not significantly diminished (over a two year period). They are concerned that leachate may be continuing to impact the groundwater. The Cleanup Association did not directly oppose the proposed remedy for OU2 (i.e., deed restrictions) however, they were opposed to the timing of the remedy selection. The Cleanup Association proposed during the public meeting to postpone the OU2 remedy selection until enough information was collected to completely understand the relationship between the landfill leachate and groundwater. EPA response to the Cleanup Association's concerns are outlined below.

2.0 BACKGROUND ON COMMUNITY INVOLVEMENT

The local community has had concerns about the site since the landfill began operating in the early 1970s. The site file retained by the Kentucky Department for Environmental Protection, Division of Waste Management, documents many nuisance complaints about the site from neighbors. There were also concerns from adjacent property owners about leachate and contaminated groundwater.

When the EPA became involved at the site in 1988, the community organized into a loosely cohesive group. In 1992 a local community group, called the Maceo Concerned Citizens Group, adopted the Green River Site as one of their projects. By 1993, certain members of this group whose primary concerned was the Green River Site, established a subgroup called the Green River Toxic Waste Cleanup Association (Cleanup Association) to monitor progress at the site. The Cleanup Association remains very involved in activities related to the site. This group has provided valuable information about the site and provided assistance to EPA in coordinating meetings with local officials and with the community at large.

Throughout the remedial investigation and feasibility study, EPA worked closely with the Cleanup Association. Draft reports and documents were provided for the Cleanup Association's comments and input. Formal and informal meetings were held in the community to keep citizens informed about the site and to discuss issues of concern.

3.0 SUMMARY OF MAJOR PUBLIC COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD, AND EPA RESPONSES

EPA issued a Proposed Plan Fact Sheet summarizing the results of the remedial investigation, focused feasibility study in May, 2000. The fact sheet also described EPA's proposed final remedy for the site and announced a public comment period. The Fact Sheet was sent to the local community, and to local, State, and Federal officials.

The 30-day public comment period began on May 15, 2000 and ended on June 13, 2000. Three sets of written comments were received by EPA. The comments were submitted by the following parties: the Kentucky Department for Environmental Protection; the Green River Toxic Waste Cleanup Association; and the Green River Coordinating Group, who are the Potentially Responsible Parties that have completed the RI/FS.

The following is a summary of the major comments EPA received during the comment period and EPA's response:

1. **The Kentucky Department for Environmental Protection (KDEP):** The KDEP agrees with the approach that deed restrictions are necessary and appropriate, however they do not agree with the characterization of the groundwater and have concerns about potential off-site migration of the COCs. KDEP recommends installation of monitoring wells off-site to show that contamination has not and will not migrate off-site.

   EPA's Response: EPA does not believe that the condition of the site's groundwater warrant concerns about off-site migration. The COCs were detected randomly across the site, and sporadically between sampling events. Samples from the furthest down gradient monitoring well detected only Barium (below the MCL) and Manganese (no MCL). There is no evidence to suggest that a contaminant plume exists and that the contaminants are migrating off-site. The COCs are metals whose fate and transport through the groundwater is highly dependent on the characteristics of the soil and water. These metals are not readily soluble in water and tend to exist as complex molecules bound to sediments and soil. Background soil and sediment samples were found to contain these metals which may indicate that they are naturally occurring. Also, independent studies conducted by the U.S. Geological Survey show that these metals are found in the natural environment in the area of Daviess County.

   As part of the OU2 Record of Decision, EPA is requiring that the groundwater at the site continue to be monitored to help evaluate the performance of the landfill cover and leachate collection system. This landfill monitoring plan will provide groundwater data that will help characterize the water quality over time. This additional information may allay KDEP's concerns about off-site migrationlof the COCs.

2. **Green River Toxic Waste Cleanup Association (Cleanup Association):** The Cleanup Association, submitted written comments on EPA's proposed remedy at the public meeting on May 18, 2000. The comments were also read aloud at the public meeting, and therefore are included in the meeting transcripts. The Cleanup Association is concerned that the volume of leachate being produced by the landfill has not significantly diminished in the two years that the system has been operating. They suggest that since there is no decrease in leachate production, the landfill cap may not be functioning as it was designed. While the Cleanup Association agrees that the proposed remedy "might be reasonable," they recommend that the cleanup decision be postponed until "we can demonstrate we understand, the water flow on the site." They further concur with the comments provided by the KDEP.

   EPA's Response: EPA believes that the hydrogeology at the site is adequately understood and that concerns about potential leachate outbreaks to groundwater are unwarranted. There is no indication that the landfill cap or leachate collection system is not performing as it was designed. The leachate collection trench was installed into the bedrock at the toe of the landfill to ensure that all the leachate produced by the landfill is recovered. The landfill cover and leachate collection and treatment system is maintained operational and functional, and is inspected on a routine basis. Data is routinely collected to monitor the performance of the system as part of the operation and maintenance plan.

   In regards to the volume of leachate produced by the landfill, EPA believes that two years is insufficient time to show a net decrease in leachate volume. Original estimates in the feasibility study suggested a period of two to four years. Prior to the installation of the landfill cap, the leachate was collected and recycled through the landfill. At the very end of this temporary remedy it was obvious that the landfill mass had become saturated with water. It is unreasonable to expect significant decreases in leachate volumes in a short period of time and conclude that the absence of a net decrease in volume is indicative of potential problems with the cap. The leachate will continue to be monitored and the system will be periodically evaluated to determine its performance. To further help evaluate the performance of the landfill cover, EPA is requiring in this ROD, that the groundwater continue to be monitored. Since the landfill cover system continues to be maintained well and all of the data to evaluate the system is being/or will be collected, there is no justification to postpone the remedy selection of OU2.

3. **Green River Coordinating Group (Potentially Responsible Parties):** This group does not oppose the proposed remedy described in the Proposed Plan Fact Sheet issued by EPA, which included deed restrictions only.

   EPA Response: In response to the concerns of the State and the community Cleanup Association, EPA decided to add a groundwater monitoring component to the remedy to help evaluate the performance of the landfill. An EPA accepted monitoring plan will be implemented under routine operation and maintenance activities. The data will be collected and evaluated for five years, and during the Five-Year Review EPA will determine to continue to collect the data, modify the plan, or eliminate this requirement.

APPENDIX B

Commonwealth of Kentucky
Letter

JAMES E. BICKFORD
SECRETARY

PAUL E. PATTON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
14 REILLY RD
FRANKFORT KY 40601

April 28, 2000

Nestor Young, Remedial Project Manager
Kentucky/Tennessee Section
U.S. Environmental Protection Agency
Atlanta Federal Center
61 Forsyth Street
Atlanta, GA 30303-8960

RE: Green River Disposal Landfill
Daviess County, Kentucky

Dear Mr. Young:

The Kentucky Division of Waste Management (KDWM) has reviewed the proposed plan for Operable Unit 2 at The Green River Disposal Landfill. While we have not had a chance to review the Focused Feasibility Study, which is the basis for the proposed plan, it is our understanding that the study conclusions are similar to those of the supplemental groundwater study conducted previously. The supplemental groundwater study indicated that groundwater contamination may be naturally occurring, but could also be attributable to the site.

The proposed remedy will implement institutional controls to preclude groundwater usage within the site boundary. While we agree with this approach, it is our concern that potential future groundwater usage outside the site boundary cannot be precluded. A solution would be to install monitoring wells down gradient to show that contamination has not and will not migrate offsite. If this is implemented, the Commonwealth would concur with EPA's proposed plan. Of course, KDWM reserves the right to review the placement, depth and number of wells to insure that groundwater is being adequately monitored.

If you have any questions or concerns, please call Rick Hogan or me at (502) 564-6716.

Sincerely,

Fazi Sherkat

Fazi Sherkat, P.E., Manager
Superfund Branch
Division of Waste Management

c: Rick Hogan
Randy McDowell
Eric Liebenauer
Robert Pugh
Central File

EDUCATION PAYS

APPENDIX C

Proposed Plan Public Meeting Transcripts

EPA SUPERFUND UPDATE

PUBLIC MEETING

MACEO, DAVIESS COUNTY KENTUCKY

%%%%%%%%%%%%%%%

MAY 18, 2000

%%%%%%%%%%%%%%%

MS. BARRETT: I want to welcome each and every one of you tonight. The purpose of tonight's meeting is to discuss the Green River Disposal Landfill site and the proposed action of the data that we have obtained through our investigation.

My name is Diane Barrett and I'm a community relations coordinator for EPA, Region IV in Atlanta and Nestor Young is a project manager for this site.

I wanted to ask you how many people are unfamiliar with the Superfund process itself? Okay. There's a few people that are unfamiliar. For those that are I'm going to run through it briefly.

Site discovery comes in different ways. Usually through people telling us what's going on, or through a facility being inspected, or an accident happening. Then the state is notified about those incidences. Then EPA is brought in at certain points to investigate it as well. So this is what's happened with the Green River Disposal site.

After the site was discovered, then the next step is putting it on the National Priorities List. If you're going along with me on this Superfund chart here.

The site was placed on the National

Priorities List in August of 1990 and then EPA was able to begin the investigation. Soil contamination was the first issue that was addressed. EPA entered into an agreement with the Potentially Responsible Parties to have that part taken care of. That was considered as Comparable Unit 1. They conducted a Remedial Investigation and a Feasibility Study on the soils and that effort was completed in June of 1994.

EPA held a public meeting and record of decision was prepared selecting the remedy to install a cap over that landfill.

However the 1994 record decision did not address the groundwater contamination. So that is the purpose of tonight's meeting, to address that. Based on the investigation that has been conducted, the Feasibility Study Nestor will be presenting to you what EPA is proposing to do. Now, this is a proposal based on the data that we've obtained. Based on professional recommendations, we have proposed that a certain remedy be selected, but it is open for discussion and that's why we're here.

We've come to the public to ask for your input as to what you prefer, what you would rather to see done. That's why we're here tonight. There's a public comment period. There is a 30 day public

comment period which began May 15 and will end on midnight June 13th.

So if there are other people that would like to write in their comments, please do so before midnight on June 13th if you don't make comment tonight.

Then once the comment period has ended, we will prepared a record of decision, which you see right there, and that will indicate what was selected here to be done regarding the groundwater. Then we will also make a notice in the paper to let you know what was selected. Then once that's done then EPA again works with Potentially Responsible Parties to determine how the design will be drawn up and prepared to implement whatever decision has been made or remedy has been selected for this site and then the actual implementation of the selected remedy.

That's more or less the Superfund Process in a nutshell. At your leisure if you could read this, this gives you a little bit more information about the Superfund Process.

This meeting because it is a post-planned meeting is one that is required by law and by law too we have a court reporter that makes a transcript of the meeting. The transcript would be available after

about two weeks after this meeting and it would be in the repository which is at the Owensboro Library for you to go there and read.

Also when Nestor gets through and also Mr. Eric Liebenauer and Mr. Richard Waitman, after these two gentlemen also make a comment then we will open the floor up to you all to ask questions. When you do if you don't mind please state your name for the record because the court reporter needs to put that so we'll have an accurate transcript of what's been said and so forth. If at any time she can't understand you, she will stop you and ask you to repeat it if you don't mind. We appreciate that.

I guess that about covers my part. Throughout the course of any Superfund activities, community relations or community involvement is a very big part of it too where we send fact sheets out, and we have the telephone calls, and we have notices in the newspaper and try to get people involved and encourage you to call us. We have a toll free number. That's listed on the program tonight, the fact sheet, and also on the back of the blue copy here there's a toll free number there. So any time that you have any questions or concerns, please feel free to call us. That's why we've got that number there, for your

convenience.

I guess that covers what I was going to say. I thank you very much for your attention and I will turn it over now to Nestor.

MR. YOUNG: Good evening and thanks for coming out tonight.

During the course of our presentation, I may get into somewhat technical discussion of what we did out there. At any point in time, please stop me if you don’t understand what I’m saying. I’ll be glad to explain it further or if you have any questions please ask.

We have reserved the end of the meeting after everyone has a chance to make a formal presentation as a question and answer period. You’re certainly welcome to pose questions during that time, but again during my presentation if you have any specific questions as to what I’m talking about, please don’t hesitate to raise your hand and ask. I want to make this flow more of an informal gathering as opposed to a formal presentation because I hope to leave here tonight with everyone understanding what it is that we’re doing. So if there are any final questions at the end, you know, keep those in mind and please ask me towards the end.

The meeting tonight is to talk about what we call the OU2 which is the second operable unit of this Superfund site. When I say “operable unit” I mean the second phase of the clean up or the second major concern of the site.

The first operable unit or the first major concern that we had was the actual waste material that was disposed of at the site. We took care of that some years ago with Operable Unit Number 1. We had a similar public meeting at that time to discuss what we were going to do about the waste material. Since that meeting we actually implemented the remedy that we proposed at that meeting.

The remedy of the landfill, just to recap briefly, is we installed a cap over the waste material that was disposed of and we installed leachate collection trenches which are essentially trenches at the bottom of the landfill that collects any water that comes from the waste material. We take that water and we treat it and then discharge the clean water into a small stream. Third component of that first remedy was excavating contaminated sediment from that stream and putting it under the cap.

Does anybody here want me to go into some of the background of this site, how the site started

and all of that?

The site started basically in the early '70s. It started by a company called - - well, the company actually changed names a few times, but the company that ended with the project was called the Green River Disposal, Inc. Company.

They basically went around the county and collected trash from various commercial and private residents and brought them to this property that they owned. They own about 40 acres out here. If you could imagine, the property is on a side of a hill so it’s sloped pretty steeply in some areas. What they did is they brought their trucks full of garbage and pushed garbage over the side and started pushing garbage down the hill and eventually building the garbage up unlike landfills today where we dig a hole in the ground and put a liner in, put the garbage on top and put a cap on. These people just backed the truck up, pushed the garbage out and then started leveling it off on top of the ground with no liner underneath. So the garbage over the years started to pile up. With every layer of garbage they put in, they put in a layer of soil and more garbage on top, more soil, more garbage on top until they finally started coming up the hill.

So they continued that practice from early '70s into the early '80s where the company finally stopped I think in 1983, I think it was. Then the company went bankrupt and the company to this day is non-existent as far as the state is concerned. So a period of about ten years or so they brought this garbage in. Like I said they had some commercial customers where they had industrial waste from some of the local factories and manufacturing facilities in the area.

So as you can imagine they're layering this garbage down and rain would fall in the garbage and percolate through the waste and at the bottom of the hill, okay, this contaminated water would flow out and that occurred for a number of years, until 1983. In 1983 the state closed the facility down and made the company put somewhat of a temporary cap and they put in a sedimentation pond at the very bottom of the hill because as you can imagine there was a lot or erosion. Every time it rained a lot of the silt and sand and whatever else washed down the hill and eventually washed down, you know, into the valley.

So they put up this dam and they created this little pond to trap those sediments from getting out. That's where the contaminated sediment came

from. All that sediment sort of settled down in the bottom and when we went and tested it and found that there was some contaminants in that sediment.

As a component to OU1 or the first phase of this clean up, we dug out all that sediment, stuck it back into the landfill and put a cap over the whole thing. Then to further collect some of the water that had been collected in that waste, we dug a trench at the very bottom of the waste to intercept any water flowing down through the waste and eventually getting down in the valley. We put interceptor trench down there, collected that water, pump it up to a building at the top of the hill where we treat it and then the treated water goes into the little tributary.

That's all been done. That's all part of OU1, what we call Operable Unit 1.

What we're here to talk about tonight is Operable Unit 2. What we did not address with Operable Unit 1 is groundwater. What about the water beneath the site, underneath? You know, what about that? Is it contaminated? How bad is it contaminated? Where are the contaminates coming from? Is it getting out? Is it affecting anyone? That's what we're here to talk about tonight.

I'm here to present some of the results of

our study of groundwater and then propose to you what we intend to do as far as the groundwater is concerned.

Over the course of the last two years, as soon as the first remedy was constructed we began a supplemental groundwater study. Let me back up a little bit.

Back before we constructed the last remedy, OU1, we did what is called remedial investigation. That was an investigation of the entire site. Basically we looked at the waste and how the waste was effecting the environment. We looked at different areas of the site to make sure there aren't any waste buried in those areas. You know, how that waste may be effecting the environment.

We looked at surface water. Is the surface water contaminated? We looked at the sediment. We looked at air. Is there fumes coming out of the landfill that may be affecting the local residents.

So we looked at a lot of things. We did look at groundwater originally. We took some groundwater samples. We installed some groundwater monitoring wells and we looked at that groundwater. The reason we did not include a decision about

groundwater at that time was the data that we had collected initially didn't tell us a whole lot. Didn't answer a lot of the questions for us. There were still a lot of unanswered questions. So what we decided to do at that time is again to break this up into two pieces.

Let's take care of the landfill first. Secure their waste material and then we'll go back and take a look at that groundwater and that's what we've done now. The last two years we've gone back and did a supplemental study on that groundwater. Collected a few more samples out of those monitoring wells and try to make heads or tails out of what the data was telling us.

After collecting those samples and looking at the data, one thing was clear to us and that is we did find some constituents that we were concerned about, but we didn't know where they were coming from. We didn't know exactly if these constituents that we were finding in the groundwater actually came from the waste material or these constituents were actually coming from the rock, naturally incurring constituents. Let me tell you what those constituents are.

Basically it's barium, beryllium, cadmium

and manganese.

By the way, I just want to point your attention to this fact sheet, this proposed plan fact sheet. Everything that I'm saying tonight is summarized in this fact sheet. So if you miss some of the fine points of what I'm saying, you can look on this fact sheet and it'll be all spelled out in here.

So the four contaminants that we were concerned about is barium, beryllium, cadmium and manganese. Let me talk a little bit about how we came to those contaminants.

Back in the initial groundwater study that we did, we installed these monitoring wells all around the perimeter of the landfill and we collected samples from all those monitoring wells and sampled them for everything. You know, organic compounds, inorganic compounds, pesticides. You name it. We sampled for everything.

Then we went through a statistical method to determine out of all those contaminants that we found which ones posed the most risk. Which ones are we going to be concerned about. When I refer to contaminants of concern, that's what I'm talking about. I mean very complicated statistical procedure that you go through where you start to weed out some

of the contaminants. It's based on how many times you found the contaminants, at what concentrations. I shouldn't call them contaminants. I should call them compounds or chemicals.

So you go through this whole list of things that you found and you start to weed out what's really not a concern. Okay? Then you kind of wheedle it down to the very few that would cause you some concern because of maybe their concentration or maybe because of their toxicity and things like that. So we wheedle it down to those four chemicals; barium, beryllium, cadmium and manganese.

So the supplemental groundwater study we did we were looking at basically those four chemicals. We went at all those monitoring wells, collected all the samples again and tested them for those chemicals and actually for a few other things too. What we found was that each and every time we sampled those wells we didn't find a very significant increase or decrease of contaminants. They pretty much stayed at the same level at each various well. So if we found a lot of magnesium in one well, every time we came back to sample that one well we found the same amount of magnesium in that one well. Okay? So it would be high over here and low over here and it would always

be pretty much at the same concentration.

The other thing that was interesting is that it was all over the place. It was high over here, low over here, you know, medium concentration over here, very low over here. It was a haphazard kind of thing. It wasn't - - if you could imagine, you know, if you were to spill liquid on a surface that is sloped, the liquid would spread out, right. What you would find is if you put wells in certain areas, you would kind of see a pattern of this material being spread out. That's kind of what we're looking for when we put in these monitoring wells. We're looking for patterns. We didn't find a pattern here. We found things that were just haphazard. So it didn't really tell us a whole lot.

We found some things, but where were these chemicals coming from? Were they actually coming from the landfill or were they coming from rock? We looked at a lot of information related to the site. Not only some of the background soil data, some of the data that was collected from the actual landfill itself that we had collected.

We looked at background information from the Kentucky, the USGS, United State Geological Survey or the Kentucky - - Kentucky has done a lot of

regional studies on groundwater and about soils and things. We looked at all of those sources of information and a lot of those sources of information told us that these contaminants are naturally occurring in the area. That you would typically find a lot of these contaminants in the soil and the rock. So that kind of complicated the picture a little bit.

We're still left with the question: Well, are the contaminants because of the landfill or are the contaminants because of the rock? What is it?

In effort not to make this a research project because we can go on for a few more years and collect a lot more data and put in more monitoring wells and just drag this out for a number of years to try to find an answer to that question. Ultimately the bottom line is what are we going to do? Okay.

We've got data to show that there are some of these contaminates in the groundwater. Do we want to expend the time and finances to drag this thing out for a number of five years or whatever and find an answer to that question.

So at the end if the answer to that question is, yes, these are chemicals that are coming from the landfill, what are we going to do about it? We still have the levels. We know what they are.

Bottom line is, what's left to do. What are we going to do about it? Let me tell you why these contaminants are of concern.

One of these contaminants I believe - - is it barium, beryllium or cadmium as a carcinogen? I forget which one it is.

Both of them. Both barium, beryllium and cadmium are compounds that have been known or that are estimated to cause cancer with a prolonged exposure. When I say exposure, drinking water that's contaminated with these contaminants for very long time.

Manganese through our estimation shows that that also posses somewhat of a risk to human health. So let me expend a little bit about risk assessment.

When we look at these contaminants of concern we have to ask ourselves what exactly are these contaminants doing. Why are we scared of these contaminants? So what we do is we do what's called a risk assessment. We look at the exposure. How does someone come in contact with this material? We look at toxicity. You know, what is the level of - - I mean what exactly does it do to you if you are exposed to it and then we try to - - from pieces of

information like that we try to estimate, you know, what is the risk, the additional risk to you for harm.

In the case of carcinogens or compounds that cause cancer, we estimate what is the increased risk that you will contract cancer from being exposed to this material. When I say “increase risk” I’m saying, you know, everybody has a certain amount of probability of contracting cancer. We’re not saying that because you’re exposed to this you’re going to get cancer. That’s not what we’re saying. We’re saying if you are exposed to this, your risk of getting cancer is increased by a certain amount, and that’s what we’re talking about.

In the case of manganese, for example, and I guess beryllium, those compounds don’t cause cancer, but they can be a detriment to your health if you’re exposed to it for a long time. We also calculate what that risk might be.

So in order to calculate what these risks are to you being exposed to the contaminants, we have to make certain assumptions. Okay. The assumptions that were made in this particular case was we assumed that in the future somebody will build a house on the property and put in a drinking water well and that person or people living in that home will drink the

contaminated water for a period of 30 years. This is a very important point.

So you can see that the risk that we're talking about is you being exposed to the groundwater for a very long period of time and ingesting it. We're not talking about bathing in it, washing your hands or face. We're talking drinking contaminated groundwater for a period of 30 years.

That was an underlying assumption in calculating what the risk would be. The other thing that we looked at is that EPA publishes what's called maximum contaminant levels, MCLs. On this fact sheet I included the little table. Let me tell you what MCLs are.

MCLs were created as a safe level by which you can analyze water, your water source. If I were to go to your home and take a sample out of your tap and analyze it, if the contaminants - - I shouldn't call them contaminants. If the chemicals that are in that water are below these numbers, then it's perfectly safe for you to drink the water. If they're above those levels, then there's certain risk to drinking that water. There's a certain risk to your health.

So just for a point of comparison we take

a look at some of the samples that we get out of the groundwater and compare them to MCLs. Now, let me make a distinction here. I said the MCLs are compared to water taken from your tap. Not from a monitoring well. There's a slight distinction. Some people may argue that there's probably no distinction because you might drink, you know, water that comes out of the well might be drinkable and not necessarily filtered or treated in any way.

Nonetheless, let's understand where those numbers were coming from. MCL, these thresholds were meant to be compared to water coming out of your tap. We compared those numbers to the MCLs and low and behold in some of the wells the levels of contaminants in those wells exceeded the MCLs for that chemical.

Let me point something out. There is an error in this table. That error is the MCLs for manganese. I show that the MCL for manganese is 50. That's not necessarily correct. There is no MCL. There is no contaminant level for manganese. That 50 that I show there is a secondary MCL.

The distinction is secondary MCLs were meant more for esthetics value of tap water. Things that would make the water taste bad, but not

necessarily harmful to you. They don't taste good. The esthetics value. Okay. Not that they're harmful to you, but just more that they're esthetically bad. You don't want to drink water that's got levels that are above those thresholds. So just to make a note here. That 50 is a secondary MCL. Not a primary MCL.

A primary MCL has to deal with contaminants that may do you harm if you drink them over those levels. The 50 there is not that. It's an esthetic value, but nonetheless, you know, we did have a number of cases there with our drinking water wells that exceeded these MCLs. If you'll notice, the exceedances weren't that terribly high. I mean, for example, barium we're looking at an MCL of 2,000 and the highest value that we got was 2,400. In the case of beryllium, Be, the MCL is 4 and the highest case we got a 6.5.

So it shows you the problem isn't significant. It's right there. You know, it's right on the cusp of whether or not it's good or bad. It's not huge. If we found huge numbers, then we definitely say, probably not question that, yes, we've got a serious problem. But here the numbers are kind of like on the cusp on the threshold.

MR. CRASK: Is that all based on per

million?

MR. YOUNG: Yes. I didn't get into the units because I don't want to make it more complicated, but the units there are micrograms per liter.

MR. JOHNSON: Is this all this meeting is going to be about, the landfill up there? Is it going to be anything for us to get water at these places we're wanting county water?

MR. YOUNG: Not really.

MR. JOHNSON: That's what I'm interested in. I watched that landfill built from the ground up. I lived up there. I moved away last year. Unless we can get water down there, you're not interesting me a bit. Good day.

MS. GORDON: Are you concerned about getting water because you're concerned about the landfill?

MR. JOHNSON: Well, our water is not fit to drink. That's what I'm concerned about.

MS. GORDON: Because of the landfill do you think?

MR. JOHNSON: Well, I don't know what it is. So far he hasn't told me anything that I didn't already know.

MS. LOGSDON: The thing is it was good before the landfill but it's not now. That's the problem.

MR. YOUNG: I'm sorry you misunderstood.

The units, you had asked about the units. I didn't talk about units because I didn't want to make this more complicated, but it's micrograms per liter, parts per million. So we're talking about, you know, when you say four micrograms per liter, talking about four parts in a million. That's how small the numbers we're talking about.

MS. GORDON: That's why the standards are set at that because it is a level of concern. Yes, it's one part per million, one part per million of -- don't negate it or try to minimize it by explaining how many parts per million because that's what they have determined is the threshold level and that's the unit they use, but when the level was one, even one part per million above one is bad.

MR. YOUNG: Correct. To cure that thought a little further. If you have seven monitoring wells and only one monitoring well shows a level at 6.5 over 4 - -

MS. GORDON: That's a 50 percent over what it's suppose to be.

MR. YOUNG: What I'm saying is: Is that necessarily a problem?

MS. GORDON: Well, if the level is four and you're exceeding it by more than 50 percent it might be.

MR. YOUNG: Okay. Let me move on.

MS. GORDON: Numbers, you can play with numbers any way you want to.

MR. YOUNG: Right. So that's why I didn't really want to get into the number game.

MR. CRASK: Don Crask.

Is this a range like on barium from 64.3 to 2400? Is that the range?

MR. YOUNG: Correct.

MR. CRASK: So lowest to the highest?

MR. YOUNG: Right. That's the lowest that we found and the highest that we found. Things are somewhere in-between.

MS. BARRETT: Is anybody consuming the water?

MR. YOUNG: I was sort of getting to that.

So after determining based on the risk assessment, EPA takes all of that information, okay, the data we collected with a picture of what the landfill looks like, what the risks are and kind of

put that all in one picture and then decide what is it we're going to do. That's what I'm here to talk about.

An additional point is that remember I said when we talk about risk we're talking about calculating a number that is determining the excess risk someone drinking groundwater on the property that is contaminated for a period of 30 years. After doing that assessment, the only two contaminants out of these four that really pose a risk in terms of EPA is manganese and I believe cadmium.

The other two didn't necessarily turn out to be a potential risk.

MS. LOGSDON: How close are these margin wells to the landfill or are they scattered out further around from the landfill?

MR. YOUNG: When you say "further out" how far are we talking?

MS. LOGSDON: I would say half a mile, a mile.

MR. YOUNG: No. They're fairly close in.

MS. LOGSDON: How about the distance then on past that. The water flows on down through those valleys. How about all that then that's flowing off of those?

MR. YOUNG: Right. I mean the question is what are these contaminants going to do? How do they migrate? How do you get exposed to them? Okay.

MS. LOGSDON: I'm drinking and taking a bath in it.

MR. YOUNG: If you don't put a drinking water, well on the property and drink that water, you'll never get exposed to it. The contaminants won't necessarily do anything to you.

MS. LOGSDON: The well is already there though before the landfill came in, before they did all this.

MR. YOUNG: Which wells?

MS. LOGSDON: The drinking water wells was already on the property.

MR. YOUNG: One of the things that we also consider is how these contaminants migrate through the area.

MS. LOGSDON: That's what I'm asking. How far do you think that those contaminants go out from the landfill, these marginal wells?

MR. YOUNG: I think I'm going to have to draw a picture for you and talk about it.

MS. LOGSDON: That's what I want to know.

MR. YOUNG: Let's take a look at what this

landfill looks like from plain view. This represents Kelly Cemetery Road. Are you familiar where the landfill is?

MS. LOGSDON: Oh, yes.

MR. YOUNG: The landfill is basically arranged in this kind of pattern. Okay. So it slopes down. There's a little tributary down here. This represents the bottom. Okay. So if you stood right here on Kelly Cemetery Road and you looked over the landfill, you're going to be looking down the landfill. Can you all see that? Okay.

Let me cut a line right through that landfill and let's look at the profile of that landfill. You have basically Kelly Cemetery Road here and then the natural topography or the natural way that the land slopes is somewhat like that, right? They came in here and they pushed waste over the site. So waste came in and waste started to build up and they sort of terrace it like this and they started building the waste up on top of the land. In other words, they didn't dig into the soil. They just pushed it over the side and started building it up like that.

So now you've got rain that falls on the surface of the land. The rain is going to fall on the

land and percolate through that waste picking up contamination. Here at the bottom you have a little tributary where all this contamination flows to, because remember water flows downhill. It's all gravity. This has occurred for a lot of years. You know, remember it started in the '70s. Went through the '80s and on until about two years ago that we put a cap over this thing.

What's groundwater? Groundwater is essentially water that exists under the surface of the land. Say the land at the bottom of the hill here, we're at the very bottom, you're standing on top here. Groundwater might be in this particular case, I don't know, six feet or so. If you put a pipe in the ground and you measure the level of the water, it might be like six feet under the surface of the land.

Back on this hill this is rock. Okay? This is a rock formation. Water doesn't flow through rock very well. Unless the rock is porous like some types of rocks or unless there are fractures in the rock. On top of the rock this piece right here is soil. So if you go over the side of the hill and you start digging down and you start taking all the soil off, eventually you're going to find rock under there.

So when the water falls on the surface, it

saturates the soil. The soil becomes very saturated. You all know what happens to saturated soil. It becomes a mud slide. It all slips down, but eventually it'll seep through the soil and eventually hit this rock. It can't continue to go down through the rock unless the rock is fractured, unless there's a fracture there or unless the rock is porous. In this particular case, a rock is pretty dense. It may be fractured right at the surface, but pretty much in the middle it's pretty dense. It's not going to let the water flow.

So water is going to come down here, hit the rock and essentially follow the surface or the topography down into the bottom of the valley hitting groundwater. The only way water moves is through gravity. You have to have a difference of elevation for the water to flow. Okay. If you have a perfectly flat plain, the water is just going to sit there or if you have a bowl it's just going to sit there. It's not going to move anywhere. It's got to have a difference elevation for the water to flow by gravity.

So this is how we're talking about the contaminants getting in the groundwater. Rain falls in, hits the waste, picks up the contaminants into the water and then leaches out the bottom as leachate.

Before we put the cap out, we were fighting leachate spilling out on the surface. I mean you would see. It was like a spring. It was essentially a spring. Water is flowing through and spilling out right on the surface. First thing we did is we came in here and we kind of collected that leachate, but also water gets into the ground and eventually hits that rock and falls straight down. So what we did is we came in here and we put a cap over this whole thing, an impermeable cap.

MS. GORDON: No. First you pump the water - - the obvious thing was to put a cap on it. It was real stupid to pump more water, but initially it pumps water over it.

MR. YOUNG: What Patsy is talking about is a temporary fix, a band-aid, if you will. What we did is these seeps that we're fighting we collected them and then we pump that water back at the top of the landfill. We created a trench up here. Where this water that we collected we pump back up top and it filtered through the waste again and come back out again and we pump it back up and we recirculated the water, kept recirculating the water. We did that for a good number of years. Probably four or five years. So we recirculated this water.

A number of years ago we came back and we capped the whole thing. We don't use this trench any more. We caped the whole thing.

Let me clean up this picture a little bit.

We capped the whole thing. So what this does essentially is as rain water falls on top of the landfill it doesn't percolate through the cap. The cap prevents the water from getting through. It sheds the water off like a hat. Essentially it's a hat. Water falls on the cap and it sheds away from the top. It doesn't allow the water to get through the waste.

The other thing we did is we came in here and at the very bottom of the landfill we cut a trench down to the bedrock. This bedrock down in here. This is the rock. We cut a trench into that rock to intercept any water that may be leaching from the waste, from any water that was already in the waste that may be leaching into the top of the soil or flowing from the waste material.

So we're catching all - - all this water that comes off the waste from the material we're catching it into that trench right there. Follow me? The leachate can't escape now. We've essentially capped it and we're treating it. A lot of that

material gets capped in that trench. Now we cut a trench in the bedrock. That's an important point because this material can't get past the trench because it hits the bedrock. It hits the impermeable rock and it goes into the trench.

MR. HOWELL: Nestor, I think in the interest of time we need to skip over some of the detail here and get on to the main purpose of the presentation.

MR. YOUNG: What was the point I was making?

MS. LOGSDON: I asked about the water going down those tributaries you were talking about there. It comes right down through those hills. I know where the landfill is. It comes in behind our house and our well is right down at the bottom of that hill. It's not – -

MR. YOUNG: I guess my point is only the water that gets on top of this landfill and flows down this direction is contaminated. If water falls on this side, it doesn't get contaminated because it doesn't go through the waste. It's only the water that goes through the landfill. It's only this water here.

Now, the landfill, if you will, is

situated in an area that's formed in a horseshoe like this. This is Kelly Cemetery Road and then right here you've got the intersection of Kelly Cemetery and Chestnut Grove. You with me? This is the landfill right here. Only the water that flows from this landfill down to the bottom, the valley of this U-shaped gets out. This is the water that is potentially, that's potentially harmful to you.

MS. LOGSDON: That's where it comes out.

MR. YOUNG: Yes. This is where it comes out. So the water flows through the landfill down to the valley floor and then flows out in this direction. It's essentially kind of northwest. Okay.

Dwight Thompson owns a piece of property right there. He also owns property on the other side of Chestnut Grove Road.

MS. GORDON: It's the old Sue Howard property. She probably knows that name.

MS. LOGSDON: We're between Chestnut Grove and Depots Road, right in there.

MR. YOUNG: This is the old Sue Howard property. The groundwater flows through this property, eventually finds its way over to Little Blackford Creek. It joins up with Little Blackford Creek and flows up Blackford Creek and eventually

finds its way out to the Ohio River.

MS. LOGSDON: There's a big culvert about this big right behind our house where the water runs down and goes through there. I know where it is.

MR. YOUNG: Right. That's where the water flows. Essentially if you're not in this area or in-between where this landfill is, generally speaking you're not necessarily effected by this landfill.

MS. LOGSDON: I don't think you understand. Where it comes off that hill from the landfill, it comes right down the valley and comes right in, right behind our house. It's not 25, 30 feet from - - talking about the valley. Our well is right there about 20 feet from where the water runs down from that spring.

MR. YOUNG: Okay. You're downstream of the landfill is what you're saying.

MS. LOGSDON: Yes. I'll show you exactly where we are here on this. See where this crosses?

MR. YOUNG: Yes.

MS. LOGSDON: We're right in that crook right there and landfill comes right down there. That's where we are.

MR. YOUNG: Okay. I understand.

Bottom line is what are we going to do

about the groundwater? What risk does it pose to us? If we don't drink it, it doesn't pose a risk with us, right?

The agency feels that the types of contaminants and the conditions of the groundwater or the conditions of the geology is not conducive for these contaminants to move very great distances. So if I sink a well 100 yards down the road, I'm not necessarily going to find these contaminants if they are related to the landfill. I'm not saying I'm not going to find them because I'm thinking these contaminants may be naturally occurring, but what I'm saying is because these are metals, these are not organic chemicals, these are metals, they don't really travel very well in groundwater.

In some instances if these were actual contaminants they might not travel 50 feet in 100 years because these types of contaminants don't move that well.

The agency felt that the most appropriate thing to do - - let me make one last point before having to go on to that.

I talked about the conditions of the geology here. One of the conditions of the geology that we found was that these wells are fairly

unpumpable. By that I mean when you try to extract groundwater out of it, they run dry, all these wells around the landfill. When you try to pump them it's been our experience every time we try to sample them that they run dry. What that means is that the groundwater right there around those wells doesn't come out easy. It doesn't move very easy because the soil and the rock and stuff doesn't allow the water to flow.

Based on all those conditions that are outlined in this fact sheet, the agency felt that the most appropriate remedy or the most appropriate thing to do here was to install legal barriers for people to get exposed to the contaminated groundwater.

For instance, we're acknowledging the fact that we're finding some of these contaminants on the landfill and we're saying the only way that anybody can get exposed to this or get harmed by it is if they drink that water. Since we can't really pump the water out and clean it, the logical thing to do is to put legal barriers to prevent people from getting exposed to the water. What the agency is proposing to do is put deed restrictions on that property. Prevent anyone from putting in a drinking water well on that property; therefore, eliminating the exposure to

contaminated groundwater. That will eliminate the possibility of somebody getting harmed by drinking that water.

Now, we're talking about putting these restrictions just on the property boundaries because legally that's the only thing that we can do. We can't put legal restrictions on all the property around it because we can't do that to the property owners. We can only do that to the site itself.

So we're putting a restriction on putting any kind of drinking water wells anywhere on that 40 acres. We're also saying we're going to prevent people from building anything on that landfill cap. I failed to mention that landfill cap is only 14 acres. It's not the full 40 acres. It's only 14. What we're going to say is that nobody can build any kind of structure on top of that cap. We don't want anything harmful to occur on cap. Remember the cap protects the waste or protects the groundwater essentially from the waste. So we're saying nobody can ever build anything on top of that cap and nobody forever can put in a drinking water well on that property; therefore, eliminating any exposure that may happen due to the groundwater.

That's basically EPA's proposed plan.

We're acknowledging that there's a problem with the groundwater. We show it in our risk assessment. We see it in the levels exceeding MCL's. We're saying that the numbers aren't significant enough to cause us a concern, you know, 100 yards, a mile down the road. We're saying that the only risk that this contaminated groundwater posses to anyone is if you go there and drink it for a long period of time. So we're going to eliminate that possibility all together. We're going to say forever now nobody can install a drinking water well on that property and nobody is going to be able to build on top of that cap because we don't want that cap to be destroyed.

Those are all the major points that I wanted to make tonight. I'm sure your head is just busting with questions or at least for some of you, you want to get up and sort of counter-point my point. Let me not prolong this any longer since nobody really has any questions I can see.

MS. CRITCHELOE: Judy Critcheloe.

What's that cap? What kind of material is it made of?

MR. YOUNG: Good question. It's a plastic liner that's fairly thick. There's a layer, another plastic layer that allows water to flow and there's

also a bentonite mat or bentonite clay cap that's about a quarter of an inch. Bentonite clay if you don't know it it's a clay material that's very solid and compact. When water hits it, it swells up and it tightens up. So that prevents any water from getting through it. You put a drop of water on this stuff and it swells up like a sponge and it prevents any further water from getting into it. So not only do we have the clay cap, the clay layer, we also have a piece of plastic. If you can envision this, this is a piece of plastic over an entire 14 acres. Sheets of plastic that were folded on top of each other and welded. Again, the landfill is sloped so that rain water as it comes on top of it gets shed away. On top of this layer that I'm talking about, this sandwich, we've got three feet of soil and then we've got grass growing on top of that. The top is like sloped. So when the rain falls on it, the rain sheds away from the top over to the sides and then flows downhill. It doesn't sit there and percolate through the top three foot layer and get down at the bottom.

MR. HOWELL: Harvey Howell.

Would you put up there for comparison the chemical analysis of the water that's coming to your treatment plant and the chemical analysis which are

discharged from your treatment plant for the four elements. Then finally tell us what your long-term plan is for the leachate. Are you going to continue to treat or are you going to jut let it run?

MR. YOUNG: We're going to continue to treat, to collect the leachate and treat it for as long as necessary. We have no plans of shutting that system down. Not until it dries up.

I have with me some tables that I made and I could put those numbers up for you if you'd like. I don't want to play the numbers game, but actually this is milligrams per liter, these units.

MR. HOWELL: So multiply that by 1,000 micrograms?

MR. YOUNG: Yes. This number becomes that. This number becomes that. This number becomes 7.9, and becomes that.

Now, what you're attempting to do is to determine what's coming out of that leachate and compared to what's groundwater. If you look at those numbers, it's close. Those numbers are close to what we're finding in groundwater. What does that tell us? Remember when they installed, when they pushed that waste down they covered it with soil. Put another layer of waste, they covered it with soil. Does that

say that these contaminants are coming from the landfill? I don't know.

MR. HOWELL: That's what you're bringing into the treatment plant? Not what you're discharging?

MR. YOUNG: Correct. Correct. That is the raw leachate. That's from - - that's total concentration in 1999. That's the most recent data that we have.

MS. GORDON: You've got contaminants in the groundwater now. Are you talking doing monitoring, surrounding monitoring groundwater wells or are you talking leachate? You've mislabeled your thing.

MR. HOWELL: No. He's giving us groundwater here. I just wanted for personal comparison to see what the leachate coming out of the landfill was.

MR. YOUNG: Correct.

MR. HOWELL: Actually the highest one you've got there is the manganese which is, what, 14,000?

MR. YOUNG: Right. Micrograms per liter.

MR. HOWELL: Which is slightly higher than the highest groundwater.

MR. YOUNG: It’s in the same ballpark, same range. You have to look at orders of magnitude. You can’t start looking at precise numbers.

MR. HOWELL: So actually even the variant, that’s only 50 percent above drinking water barium. 2,000 drinking water barium and you’ve got a 3,000 variable leachate.

MR.YOUNG: You don’t have any drinking leachate.

MR. HOWELL: No.

MS. GORDON: Yes, but you’re - - well, we have a little question about your monitoring well placement, but anyway we’ll get into that later.

MR. YOUNG: Yes, but see take those numbers and start imagine if that leachate is not getting into the groundwater. Those numbers start coming down because the groundwater starts diluting it.

MR. HOWELL: One other point I’d like to make and that is the leachate is a million gallons a year now? It hasn’t come down?

MR. YOUNG: Yes. Roughly.

MR. HOWELL: Million doesn’t - - it sounds like an awful lot, but in terms of what you and I can understand it’s I think 2 gallons a minute which is -

- like how long does it take to fill up a gallon milk jug? It's a pretty slow flow actually.

MR. YOUNG: Yes. The thing doesn't run all the time. It's sort of batch process. It's not continuously - - it's not a running faucet.

MR. HOWELL: This is not a river of water coming down. It's a milk jug every couple of minutes or something.

MR. YOUNG: Yes. When you say million gallons, you know, in one year you think that's a lot of water, but this is not like you turn the faucet on and all this water is coming out. Like I said it's, yes, dripping and the trenches kind of fill up and the pumps come on. Set it up the - (inaudible) - and the pump shut down and then you have to wait until the trenches fill back up again. It's a batch process. It's not a continuous thing.

MS. GORDON: Do you notice in periods of heavy water flow you have a chart showing like when it's dry? Is this a pretty even flow throughout the year or does it vary with rainfall?

MR. YOUNG: I think it varies somewhat. I haven't done an analysis in awhile.

MR. DARWIN: Robert Darwin is my name.

I work with a group of companies that are

in charge of working on this property for the last ten years.

The treatment plant has been running approximately three years. Two years since the cap went on. We haven't seen much change over the past two years. Harvey is right. It's about a million gallons a year. We average about 18,000 gallons a month, the last few months. I'm sorry. 18,000 a week. That wouldn't add up. Which is about two gallons a minute. We didn't see much variation per month. The drought, there was a prolonged drought in the summer through the fall. We saw a little bit of drop off then, but not significant.

MR. YOUNG: You're going down a path to a very controversial discussion I guess as far as you guys are concerned. What I want to do is can we kind of delay that discussion for a little bit?

MR. HOWELL: I'm done. I just wanted people to visualize. For the benefit of the people in the room, I want to put in real terms for them what that million gallons meant.

MR. YOUNG: I almost put those numbers in this fact sheet, but I don't know what conclusions you can draw from them. It still doesn't answer any questions. It just confuses the matter even more.

Let me stop here and let other people come up and say their peace and then after everyone is done we can come back to this discussion and I can get as detailed as you want. We can make this a college presentation if you want to or we can keep it simple. At this time I'd like to let Eric Liebenauer come up and give Kentucky's perspective on what EPA is proposing.

MR. LIEBENAUER: Thanks, Nestor.

My name is Eric Liebenauer. I work in Frankfort for the Department for Environmental Protection. As you know Nestor works for EPA so he's paid by the federal government. Fazi Sherkat, my manager, he and I are your state government. So EPA is the lead agency at this site. They make the decisions. Our responsibility is review and comment. Just so you understand where we fit in.

However, we represent your interest as you are Kentucky tax payers and citizens and we are the people that we feel you should be able to come to if you have any questions or problems and we will certainly review any comment under EPA's work to make sure that we think - - what we see done is what we think should be done.

Let me just start by saying that EPA's

plan to go ahead and put a deed restriction on the site, keep people from drinking the groundwater we feel is both necessary and appropriate. We think that is a solution that fits our law which is KRS 224.01-400. I know that's a mouthful. We refer to it as our Spill Cleanup Law. It says that people can manage their releases. As far as them putting in deed restriction on this site, we do agree with that.

On the other hand however, we think we're going to have to disagree with his remedy overall the way it's written for the following reasons: We've been reviewing a couple of documents EPA sent in recently. The first of these was the draft remedy or draft rod for Operable Unit 2. The other document that just came in that we reviewed is what's called the Focus Feasability Study. It's a report that's written, that EPA uses to evaluate the possible remedial alternatives to decide what they're going to do at this site.

Let me just outline some of our conclusions are that are different from EPA's that make us feel like we need to disagree.

This is a map of the site very similar to the one Nestor just drew. This is Kelly Cemetery Road as you're all aware. The thin dotted line is the

boundary of the cap that EPA put on Operable Unit 1. The thick dotted line with the square corners is the property boundary. Now, as Nestor pointed out there are metals in the site groundwater that are above safe levels to drink. Specifically we at the state have noticed that the pair of monitoring wells down here in this part of the site, MW3 and MW10 have both the cadmium and the manganese that Nestor described above safe levels.

Now, the Feasability Study Report that I talked about goes to great lengths to explain where these metals might have come from and they draw a couple of conclusions. Notably that these metals might have been from the background; in other words, some are off site. The metal water quality is such that you find these metals at that’s concentrations. We cannot agree with that conclusion. We note that monitoring well MW5, which is here at the top of the landfill, has the same metals in it. It also has ammonia in it. Same with monitor wells MW3 and MW10. They all have ammonia in it. You’re probably asking yourselves why is that significant.

Back before the cap went on this site, the first people out there found a pile of salt cake fines at the top of Kelly Cemetery Road in the area of

monitoring well 5. What are salt cake fines? Some of you may know. They're a product or a byproduct of primary aluminum smelting. When people smelt down aluminum it comes in in box form. They have to melt it to get molten aluminum.

On top this they pour salt from a flux so the atmosphere doesn't contact the molten metal and form an oxide or a rust. That salt can be refined because it has a high concentration of aluminum. So the aluminum industry will take this stuff and they'll remelt it, tap off more aluminum and they'll pound it flat. Little pieces of aluminum inside it will roll out and they can sift it. That recovers most of the aluminum from it, but what you have left are called salt cake fines. Now, salt cake fines have a lot of different things in them, but three of the things that are very interesting to us tonight are metals, salts and nitrogen.

Metals you seem to get up almost all of them. Sometimes you don't get mercury at other sites, but that's not something we're talking about here. The nitrogen is significant because when these salt cake fines get wet they produce ammonia. The ammonia goes into the atmosphere. The ammonia is soluble in water. It winds up in the ground water.

So the fact that we have ammonia in monitoring well MW5 and in monitoring well MW3 and MW10 indicates to us that these wells are contaminated. The elevated levels of manganese and cadmium of these wells can be attributable to the site and specifically to salt cake fines.

We also noticed in the past reports that salt cake fines were distributed sort of randomly throughout the landfill which could explain the fact that they're here and sort of across the site over here or it's possible there's some sort of flow conduit between MW5 and MW3. So this is one of our problems with the Feasability Study Report. We think that it pretty clearly shows groundwater contamination at the site. We don't think it should excuse this contamination based on regional groundwater levels.

The other thing that the site showed was data from this monitoring well which is off site MW1. This is probably going to be a little hard to read for those in the back. MW3 and 10 are up here and that just shows the cadmium and manganese I talked about earlier. MW1 the data is down here and it shows three contaminants that we are concerned about.

The first is methene chloride which is a solvent. You can buy that at the hardware store. The

next two are the pesticides DDT and DDD. Now, this data was taken in 1998. It may be old. If we resample that well, it's not clear what we find. If we find the same level as lower levels or what. We'd like to see that well resampled because if the groundwater quality is still as this sampling showed it, then there are three contaminants off-site that are probably from this landfill. So we think this is another indication that the groundwater is contaminated.

The next question the Feasability Study doesn't address that it probably should in our opinion is assuming these wells are contaminated as we believe they are, what happens to the groundwater?

Nestor made the point earlier that the groundwater pretty much flows along the topography of the site. From the high along Kelly Cemetery Road down into the valley where the tributary of Little Blackford Creek starts. We agree with that analysis.

These lines, this is by the way the same map I just showed you. It has a few lines superimposed over it.

These lines here are the height of the groundwater tables above sea level. You can see the groundwater table starts about 475 feet above sea

level along Kelly Cemetery Road at the top of the site and flows sharply downhill to about 420 feet at the bottom of the site. What that says is exactly what Nestor just says. That any groundwater contamination that's already here will flow this way.

That raises the question in our minds is what is the contamination in monitoring wells MW3 and MW10 doing. If you'll notice they're in proximity to the property line. They're basically right on it. We think the groundwater contamination has probably flowed off-site from these two wells. In addition, MW1 is already off-site. We think that groundwater underneath MW1 is continuing to flow further off-site.

Nestor pointed out that some of the groundwater underneath the site discharges to the tributary of Little Blackford Creek; therefore, it's not possible for people to drink it. We doubt that all of the groundwater on the site does that.

The main question all this raises in our opinion is if EPA is willing to deed restrict an area that is on the side of a ridge and has a bunch of garbage underneath it, it seems that they should be willing to deed restrict or at least address using monitoring wells or some other mechanism that meets our legal requirements the area beneath it that's much

more suitable for habitation. Notice the presence of the former Sue Howard residence. People have lived there in the past. If they've lived there in the past, it seems like it would be a nice suitable location for them to live in the future. We think EPA should address it.

Part of the reason that this difference of agreement is coming up between EPA and the state over the possibility of contamination is the fact that there isn't a good monitoring well on site. The Feasability Study uses MW5 as a monitoring well, but as I've just said it's contaminated and it's not going to - - we can't use it as a monitoring well.

What we're asking EPA to do is either install background wells to prove that the contaminates here in MW3 and MW10 are indeed naturally occurring. We don't really think they are, and resample MW1 to show that for some reason the DDT, DDD and methene chloride are indeed not there or put in wells to show that these contaminates are not migrating down, downgrading it further specifically here. We don't want - - we want to see if these contaminants are migrating off-site or some other remedy that will protect possible groundwater users off-site down in the valley floor.

That concludes my presentation. I'm going to turn the meeting back over to Nestor, but if you have any questions for me I'll be happy to stand up and answer them.

MR. YOUNG: Leave that up.

I want to clarify one point. The actual property boundary that we're talking about, this is indeed the physical limits of the 40 acres owned by Green River Disposal, Inc., but in fact the responsible parties back when we first started this project installed a fence that encompasses 40 acres plus an additional piece of land. The fence actually goes out this way a little bit, completely encompasses MW1. The sedimentation pond is over here somewhere I believe. So the fence includes that sedimentation pond, comes out to here. I'm not quite sure exactly where in this location the fence comes back in and meets the property line.

So when I say the site, I'm talking about this entire 40 acres plus an additional 20 acres or something that's inside this fence line. When I talk about the site I'm talking about everything inside the fence line. According to this drawing would encompass MW1 and this part in here. I just want to clarify that drawing.

MS. LAYSON: Pat Layson, L-a-y-s-o-n.

Would the deed restrictions also include this extra fenced area?

MR. YOUNG: Yes.

MR. LIEBENAUER: Who owns that property, Nestor?

MR. YOUNG: BFI. I don't know if you're familiar with BFI, Browning-Ferris Industries. They own more than 100 acres in this area.

This picture represents the landfill from Kelly Cemetery Road all the way down to the valley floor. The valley floor is represented by this little squiggly line which is the tributary that's down there. From this point north, the topography of the land starts to go up to Chestnut Grove Road. BFI owns over 100 acres on this side of the valley and then through here. They also own that additional whatever it is, 20 acres or whatever it is through here.

Another point is BFI is a responsible party at this site. When I say "responsible party", the EPA identifies those companies that had some liability in relation to the contamination on the property. We've identified BFI as one of those responsible parties. When I say that we're going to impose deed restrictions on everything inside the

fence line, that includes the additional acreage that's owned by BFI. Because they're a responsible party I think that they would, you know, grant us those deed restrictions on that portion of the property.

MS. CRITCHELOE: Is BFI also a disposal company?

MR. YOUNG: Yes, they are.

MS. CRITCHELOE: They're still disposing stuff up there?

MR. YOUNG: No. This landfill is closed.

Ms. CRITCHELOE: Okay. What are they doing with the extra 100 acres that they own?

MR. YOUNG: It's vacant. It's just wooded land.

MS. CRITCHELOE: So they're not using it for any type of disposal?

MR. YOUNG: No. No. They're not using it. It's just vacant land.

MS. CRITCHELOE: Well, does EPA supersede the state? I mean he was talking about like how you all disagreed on your different findings and they were wondering what the federal EPA was going to do.

MR. YOUNG: Right.

MS. CRITCHELOE: You take precedence over

the state's, our state environmental - -

MR. YOUNG: Well, the responsibility for making a decision lies with EPA, the federal EPA. We certainly take into consideration the state's comments. Also importantly the community's comments. That's why we're here tonight.

Diane mentioned this is a proposed plan. No decision has been made. This is what we're proposing to you and to the state and saying this is what we'd like to do. What do you think?

MS. CRITCHELOE: So you're saying what you decide, you make the final decision?

MR. YOUNG: Ultimately we're responsible for making final decision, whatever that may be.

MS. GORDON: We have a longstanding community group that's monitored this well for a long time. We're always welcoming new members.

MR. YOUNG: If I can introduce Richare Waitman. He would like to come up. He represents the group and he would like to make some statements regarding our proposed plan.

MR. WAITMAN: My name is Richard Waitman and a group of us have been monitoring the clean up of this site and talking with the EPA and the Kentucky Waste Management folks for many years.

My first meeting in this room with Nestor was in 1992. So you know how long we've been at it.

Now is not a good time for this decision. This site has always been primarily a groundwater contamination problem. The premise of the clean up was the bad materials were to be located in the dump area of the landfill. Then covered with a cap of waterproof material to prevent new water from getting in to them. The contaminated water, which is called leachate, in the dump would be pumped out at the bottom of the dump and filtered clean. Over time the dump would dry out and since no new water was going through it, it would not put out contaminated water which would pose a risk to the community. We say this is sort of like pouring water through bad coffee grounds. If you put a clay cup over the grounds, stop the water from getting in and clean up the water in the cup, the problem is solved.

If this had happened, this proposal might be reasonable. This has not happened. The cap has been on for several years and the flow of leachate (the bad coffee) is about as great as ever. This was with last year being one of the driest years on record. The fact that the water is coming out as strongly as ever means we do not have a cup that is

water proof around the dump material. This means that the risk and expense of running pumps to treat this volume of leachate is infinite.

Our companies should not bear this treatment expense indefinitely and we should not be at the risk of the escape of contaminated leachate indefinitely. This also suggests we do not understand the water flow as well as we thought we did. If we do not know where the water is coming in from, we may not know all the places it is going out. The leachate data and the presence of the metals in the monitoring well clusters MW3 and MW10 shows contaminated water is getting out of the landfill.

No permanent decisions should be made until we get the flow of water through the site under control and dry out the material under the cap as evidenced by progressively cutting down the flow of leachate.

Now, the study argues that various metals are found in the soil here naturally and this explains why there are metals in the water samples. Yet at the same time, the study says the metals do not enter the water and travel about. It is not clear, and you all can see the map, that there is an upstream monitoring well that proves these metals occur in our ground

water naturally. It is also not clear what effect the presence of the ammonia produced by the salt cake coming in contact with the water may have on the leaching of metals or their ability to move in groundwater.

The proposal for clean up, involving drying out the landfill, that would lead us to this step has not happened. No permanent decision is warranted until we can demonstrate that we understand the water flow on the site. We agree with the comments of the Kentucky Waste Management folks.

MR. YOUNG: Does anybody else want to stand up and say anything?

MR. HOWELL: I'm Harvey Howell. I've worked for 30 years as a mining engineer in strip mining and I've done a lot of reclamation. I've come across similar problems in the past.

One of the things that I heard from Nestor was looking for a plume. Now, there are two kinds of rock that we're looking at here. We've got hard rocks like sandstones and limestones and coal measures that are the reason these hills exist. As you go to the north towards the Ohio River you get into alluvial soils. You can rationally look for a plume in an alluvial area where water has kind of free-flow. Just

like a smoke stack, so you can have a water plume.

But in cracked and crevice rock like you've got up here, you're not going to see a plume. I don't think that you should be looking for one.

I agree with the Kentucky state people that there is evidence that there is some kind of contamination heading off the hill into the north outside the area that we have put our monitoring wells. I personally would love to see more monitoring wells put up here looking because as you get further downstream and that valley starts widening out, you get into more and more depth of alluvial soil. It's easier to drill a well anyway. You will get more consistent results and you will be able to convince us whether or not there is any significant pollution escaping from the site in the groundwater.

MR. YOUNG: Does anybody else want to make any comments?

MR. SHERKAT: My name is Fazi Sherkat. I'm with the Superfund branch.

I just wanted to emphasize one of the point Richard brought up. The fact that stuff is coming off - - the leachate is being generated more than it should be is not a factor in the state's mind because under 01-400, KRS 01-400, as long as that

plume is managed within the site this is the burden that the company is going to put upon themselves for many years to come. So that particular problem is not something that the state is concerned about like already mentioned by Eric and Harvey. The main issue is what is, if any, is leaving off site through the groundwater. I just wanted to clarify that point.

MR. YOUNG: A point that I wanted to make is when we talk about contamination of groundwater, in my opinion we're talking about a contamination that existed there before the cap went on. Once the cap was placed we believe that no further contamination of the groundwater continues. There's no more water percolating through the waste material and getting out. I think we have managed that issue fairly well.

MS. GORDON: No. No.

MR. HOWELL: Your presentation two years ago were that after the cap was put on and see a decrease in the amount of leachate. That has not happened; therefore, there has to be some kind of a spring on the hillside there now buried underneath. Whether it's being really nice and coming out and going down through the original soil and coming out from the bottom, that would be really nice. Maybe however it's spurting out a little bit into an old

dump and dissolving some materials on the way out.

MR. YOUNG: Let me put that in a picture. What you're saying is groundwater flowing this way, groundwater may be coming out and in the middle of this material is springing it out out there.

MR. HOWELL: Well, hopefully it's not springing out. Hopefully it's just running on down.

MR. YOUNG: Well, coming out and then maybe traversing a path going down. That's a reasonable - - that would be a reasonable - -

MS. GORDON: The point is you have a major fatal flaw in what you're saying because you have not noticed a decrease. Your point is you put this cap on. You should have a lot less water flowing out. It should be spreadly dewatering and that was the whole logic that everything rested on and it's not happening.

MR. YOUNG: Right, but the point is are these contaminants escaping the landfill cap?

MS. GORDON: You've got a screwed up cap problem.

MR. HOWELL: We don't know. Go drill us some more wells and let's find out.

MR. YOUNG: Here's another scenario. This is reasonable. I'm not necessarily discounting that.

Now, we're talking about leachate volume here. This is a perfectly reasonable explanation for why we're getting more volume. I'm not necessarily discounting it. That's perfectly reasonable.

The other perfectly reasonable problem might be, remember I said these trenches were dug down in bedrock. Shallow groundwater may actually intercept the bottom of that trench and we may be actually sucking up clean groundwater from down there and that could be where the volume is increasing as well.

I'm not here to provide answers to those questions. I don't have answers to those questions.

MR. WAITMAN: Nestor, the point is that we had a plan and the plan rested on certain assumptions which were perfectly reasonable assumptions, but the test of the correctness of the assumptions is what is factually happening. When you and I talked in this very room in 1992 and I said that we would wind up one day putting a bentonite cap out here. We talked about bentonite clay, pump and treat. I said before you're done it's highly likely that you'll need to have a slurry wall or an interception trench somewhere because something is going to try to sneak in on you somewhere. I don't know where, but there always is

one.

I still think you're right now where I thought you'd be in 1992. You've got a good cap. I watched them put it on. No one could have been more diligent or done a nicer job. I do not believe water is going through that cap for one minute, but I think there are a number of explanations that could explain where that water is coming from. I think until we know the answers to that, we're not in a position to move to the next phase or a plan. Once we know that, where is that water coming from.

Now, you can probably make some educated guesses if it's a spring and flowing through the same area. Then the concentration of the leachate should go down while the volume stays up. You all are smart enough. I'm not an engineer. You guys are smart enough to figure that one out without a lot of help.

If you had our engineers back when I used to fool with this would have had a pretty accurate guess on how much water could be in there and they would give you a chart that showed them some pretty accurate guesses as to how that drop off should occur over time. I don't see those charts, but I do know there's no drop off and it's been two tough years. All we're saying is it's not that the leachate is that

bad. It's that it shows us that there's something we don't know that we need to know before we go on.

MR. HOWELL: You brought up a question though that Nestor probably has the answer to and is very interesting. Although the volume of water is not decreasing, is the concentration or contaminant increasing?

MR. YOUNG: I can't tell you because I don't -- I didn't look at it.

MR. HOWELL: Those figures must be available, right?

MR. YOUNG: Yes. I don't have those numbers with me so I can't answer that question. I don't know.

MR. HOWELL: And you haven't been following it?

MR. HOWELL: The leach treatment plant is not on an average monthly analysis of any –-

MR. DARWIN: It's just affluent sampling only. That was worked out with the State of Kentucky.

MR. YOUNG: Every once in awhile we require, Robert, to take an influent sample. In fact, for this study we took an influent sample and that's the data that I put up there.

MR. HOWELL: One more point. I differ

from Richard.

Richard, I differ from you. I don't think that we're going to go back now and mess around with that cap digging in there trying to find out where this water is coming from. We've done it. We agreed that we were going to put the cap on. We're going to have to live with the consequences. I wouldn't go digging. I don't think there's very much you can do on the dump site or upstream from the dump site at the moment.

What we have to do is to look to the future downstream from the dump site and to me that means some more monitoring wells and follow them for another five years before we decide what we're going to work with.

MR. YOUNG: Let me make another point before I take another question.

Some of you may be wondering that once we make this decision EPA is going to just walk away and put a lock on the gate and walk away and that will be the end of it. That's not true. We have a legal requirement to come back every five years and evaluate this remedy. Make sure the remedy is continuing to provide protection. If it's not, then we've got to make changes to it. So it's not like this is the end

all. We're not closing our books on this. We've got to come back every five years. We've got to come back every five years and - -

MS. GORDON: But we're not even willing to close the books at this point.

MR. YOUNG: My point is that we're not.

MS. GORDON: At this point we're not going to.

MR. YOUNG: My point is that we're going to be back every five years. We're going to continue monitoring the site and we're going to continue monitoring the effectiveness of this remedy. In the future if something needs to be changed, it'll happen.

MS. GORDON: No. We're not going to agree to the remedy. You're going to check what the remedy is and we're not - - we're not satisfied basically. We'll have to talk probably amongst ourselves to agree to come up with more - - 30 more days, but we're not satisfied. We think it's a fine cap. I think maybe you misunderstood my comments. We don't have a problem with it being a bad cap job, but the cap is not doing what you thought it would do. You've evidently got a problem somewhere else. Whether it's a spring. Whether infiltrating from the top, side. Your own water flow is not doing what it ought to be

doing and there's some reason it's not. I'm saying a problem with the cap. I don't mean the cap itself. I mean there's a problem with the cap not doing the job that you expected it to do, and designed it to do and you thought it would do. I'm not arguing with you that it's doing what you think it's going to do. Look at your water flow, it's not dropping.

MR. YOUNG: I didn't understand your question.

MS. GORDON: If the cap was working as you anticipated, your water flow would be dropping.

MR. YOUNG: Technically, yes.

MS. GORDON: Your water flow is not dropping. Your cap is not operating as you anticipated. We don't think it's a faulty cap. We watched them put it on, but you've got a problem somewhere else now. You've got -- something is not working as anticipated.

MR. YOUNG: I don't totally disagree with that.

MR. JOHNSON: You've got some monitoring wells. Have you monitored any of the natural springs up there?

MR. YOUNG: We have. Actually the state has pretty much canvassed that whole area.

MR. JOHNSON: Tom Johnson.

There's like two springs on the other side of the hill from that land site.

MR. YOUNG: Yes. The State of Kentucky has monitored it and we have not found anything, any of these contaminants in those springs.

MS. PAYNE: Brenda Payne.

The question we have, and I know everybody in here that lives around this is you've got a cap on here. It's suppose to be fixed.

Now, Tommy lives down below us and that was his parents in front of us. His water is contaminated and everybody else is down the well.

Now, if this is a cap, are they going to like are they going to be able to use this water, open it up and use this water, or is it going to be permanently you cannot use any of it for drinking or anything else?

MR. YOUNG: Not water on the landfill. Not water on the property.

MS. GORDON: Off-site property. Down gradient off-site property can they use - -

MR. YOUNG: I can't comment on any property outside of this site because I don't know their quality of water there.

MS. CRITCHELOE: Can you all not test that? I mean do you not go out and get samples of people's water?

MR. YOUNG: Back at the start of this investigation, we actually did a well survey. We went around to every single property in this whole area. We looked at if they're on wells or if they're not on wells. We actually tested some wells. We didn't find any serious concerns on the various properties that we tested.

Very interesting point. The old Sue Howard property had a well on it at one point in time and that well was tested. Interestingly enough, the only contaminants that were found in that well that caused any significant concern or any concern at all were arsenic, salenium and - - actually arsenic was the main concern in that well at the time. I think that data was actually used to put this site on the National Priorities list.

MR. HOWELL: Probably from spraying the fruit trees.

MR. YOUNG: What's interesting is we never found any arsenic anywhere on the property, anywhere on the landfill.

MS. GORDON: No. No. Martin-Marietta's

stuff on top of the ground had a lot of arsenic in it.

MR. YOUNG: Arsenic was not a contaminant of concern. Like I mentioned before we tested all the wells.

MS. GORDON: It was a surface contaminant out of the barrels when you cleaned up the barrels. There was a lot of arsenic.

MR. YOUNG: Are you referring to the barrels that were at the Kelly Cemetery Road?

MR. WAITMAN: That was the state ground clean up.

MR. YOUNG: Right. The state went in there in 1985 and removed those barrels and we actually as part of this investigation went back and tested the soil on 25 acres along Kelly Cemetery Road specifically looking for contaminants related to those barrels and we found none.

MS. GORDON: The barrels themselves were full of arsenic though and they were tipped over and different things.

MR. YOUNG: There was no contamination as a result of those barrels.

MS. CRITCHELOE: What is contaminating that water then?

MR. YOUNG: Well, that was the point that

I was making earlier. I can't answer that question. We don't know. We don't know for sure that these contaminants that we're talking about are coming from the landfill or are naturally occurring.

MS. GORDON: They want to say they're naturally occurring and sort of going down the road and that's why we're digging our heels.

MR. YOUNG: No. I'm not necessarily saying that they're naturally occurring. I'm saying there's data to suggest that they're naturally occurring I'm saying we've got contamination. I can show you. All I'm saying is what are we going to do about it? What EPA is proposing is to put these deed restrictions in place to eliminate any potential exposure to anybody to this groundwater. I'm not saying we don't have contamination and I'm not saying that the contamination is not coming from the landfill. I can't answer that question definitively. All I'm saying is in the end the bottom line is what are we going to do about it.

MR. HOWELL: Here's the point: You are concerned enough that you want to put deed restrictions for using the water in the area where you've had wells that show some contamination.

MR. YOUNG: Correct.

MR. HOWELL: You have not continued your drilling down slope from the contaminated wells until you have found wells that are not contaminated and can draw the line and say, from here on out it's okay to drink the water.

MS. PAYNE: That's what I want to know. Can we drink the water?

MS. CRITCHELOE: That makes sense.

MR. HOWELL: In order to define your limit of contamination, you have to continue drilling wells until you drill a well where there is none.

MR. YOUNG: Monitoring Well 1 is the furtherest downgrading well that we have.

MR. HOWELL: We need further downgrade because that's still contaminated.

MR. YOUNG: This well right here has none of the contaminates in any significant quantities that we're talking about.

MR. HOWELL: It has however DDT you said.

MR. YOUNG: Not in a quantity that would effect any kind of remedy.

MR. HOWELL: So maybe all you need to do is drill three more holes.

MR. YOUNG: Let me just say the only thing we found in this well was barium and manganese.

Barium is below the MCL. The concentrations of barium in this well don't cause a concern. Manganese, the concentrations found there, the highest concentration was 293 parts per million, micrograms per liter. Relatively small compared to the concentrations we were finding here.

MR. HOWELL: This is wonderful. I think all you need to do is drill three more wells and put this whole business to bed.

MR. YOUNG: So I understand from the citizens group is what you're recommending is putting wells downgrading from MW1, shallow monitoring wells?

MS. CRITCHELOE: Or could we have another individual water testing again, evaluation? What do you do? Ask for one or recommend someone come and to test your water or what?

MR. YOUNG: Let me just say: I want to make sort of distinction, separation here. What I'm talking about tonight is what are we doing based on the concentrations that we're seeing here in the groundwater? Are these concentrations enough to cause us to implement some sort of active remedy? Do we want to pump out the groundwater and clean it up?

What EPA is saying is we don't think so. We don't see that these concentrations are high enough

to implement an active pump and treat.

Now, if we're talking about monitoring the site to make sure no contaminants get further on down the road, we can do that under the operation maintenance of this landfill. Remember EPA has to come back and make sure that this landfill is operating and is continuing to protect public health and the environment. So when we're talking about monitoring the performance and making sure that no more stuff gets out, we can talk about that under the operation maintenance of the landfill and not necessarily talking about are we doing that because we're concerned that there's groundwater contamination.

MS. GORDON: You're talking operation and maintenance and we're saying - - one of my concern is we sign off when we get to that point you're not going to be willing to back up. We have serious concerns about - - you're not going to be willing to back up. If you've got serious problems, you need to fix it. Oh, we've already gone one to maintenance and operation. We're not into fixing serious problems.

Now, we may still have some serious problems to fix. I have questions about. I think the state has questions about that.

MR. YOUNG: The five year review. If we get the five years and you're saying, the landfill is not operating the way it's suppose to be operating and we have to effect some changes if we can do that.

MR. LIEBENAUER: Nestor, can you clear up a question for me about the five year review?

MR. YOUNG: Sure.

MR. LIEBENAUER: I haven't actually gone to too many myself. It occurs to me that your five year review, does it only mean that you have to review what the remedy say you could do? That's kind of my understanding. Five year review says is the remedy working the way we wrote it? That's kind of why we wanted you to change the rod to say we would put wells in as part of the rod. That way the five year review would say, you know, if these wells have problems. If we just get the five year review and the rod doesn't say anything about wells, we don't understand if you're obligated to do it. Is that the situation? I know we talked about five year review on the phone, but that question came up in my mind.

MR. YOUNG: Yes. Here is where that distinction between a groundwater rod and operation maintenance of the landfill kind of intertwine.

Basically the five year review says that

we come back and review the remedy to make sure that it is operating the way it should be and that the remedy is continuing to provide protection to public health and the environment.

MR. YOUNG: But if the remedy doesn't call for downgrading wells and the wells we have still show the same level, then it's not clear that operation of maintenance that you have to put more downgrading wells. That's kind of my question.

MR. YOUNG: To be honest the agency hasn't approved the operation and maintenance plan that the responsible parties have provided so far.

If we want to talk about monitoring the effectiveness of this landfill, we can put in some wells further downstream just to make sure that these contaminants that we're holding back here aren't getting out.

MR. LIEBENAUER: Are you talking about the OU1 operation of the maintenance?

MR. YOUNG: Correct.

MR. LIEBENAUER: I thought you might be talking about OU2 operation.

MR. YOUNG: No.

MR. WAITMAN: Richard Waitman again.

The reason that it seems a little early to

me is, one of the facts is if it were moving off stream you would want to go down the stream and get easements for development and drilling and other things and pay the landowners for those rights and control rights off your site. You might have to do that if the plume is going out there. That could become an ongoing and big problem expense and a big agitation to the people like me who may be effected by it at some point in time.

Until you know - - on the other hand, if you were able to dry this thing up, if the plan that we talked about here many, many, many months and years ago were working, you probably wouldn't have to worry about that too much because if no water is going through the bad coffee grounds, then it follows that. Little bad coffee is getting out no matter what.

So the monitoring wells if you put them in might show you a need to attempt to acquire some form of land control beyond your boundary which would be expensive and time consuming and irritating. The other possibility would be to back up and tighten this thing down and dry it up. I don't know which is the more cost effective or the better way, but I think there are alternative ways to approach the problem.

I'm not sure that what we have in hand now

clearly gives us the right answer, but I see two potential solutions to the same problem, but if you do nothing and if the volume remains the same it's got to go somewhere.

I think there's a lot more that can come of this if we don't get this thing dried down.

MS. GORDON: Nestor, you've heard me squeal all along, if you talk about 30 years is this great long period of time. My family has been here since 1790. Thirty years is a blink of an eye to me. I'm 45 years old. Thirty years is nothing. What I'm afraid of is in 75 years or 150 years, people are going to forget about this thing and start drilling wells. I understand the legal restrictions at the courthouse and this that and the other, but there's no solution as good as truly fixing it rather than just trying to prevent people from drinking because you haven't fixed it right.

Now, our group's, a lot of stick all along has been that these companies, a lot of people - - for the people on the front row that's having problems with these things, probably a lot of people think that, you know, it's paid for through magic of the federal government or some big fund or tax payers.

In this particular case, certain companies

have stepped forward and they're paying the tab on this thing. They're paying Nestor's salary. They're paying Nestor's airplane tickets. They're paying Nestor's hotel room. They're paying every single bit of expense involved in cleaning this thing up and these are companies that most environmentalist don't look at it this way, but these are companies that provide the good jobs in this area and they're having to compete nationally and internationally and they can't afford to be bled dry.

We've tried as a group to be very conscious to being reasonable. We want a good job. We want the environment protected. We want a good job in the first place so it won't blow up on them later. We tried to be reasonable and understand.

These companies at the time they did it, it was a commonly accepted business practice and it was legal. Now, these were educated people that knew this was really bad stuff and they were dumping it over a hillside somewhere. It wasn't smart if you thought about it, but they had to compete in the business environment at the time and that's what everybody else did. If they didn't do it too, they couldn't have competed.

They've now stepped forward and say, you

know, we're paying out the wazoo for this thing. So we have a fair amount of feeling for not asking for unnecessary expense in this thing. We've tried to be very conscious in that all along. You have to admit. We have bent over backwards to hurry the process for the company's sake and for the environment's sake both, but if we've hit a major problem here, you know, if this thing is not doing like it ought to be doing, then we need to stop and figure out why or make sure how badly it's not doing what it ought to be doing. It's going to cost some money up front. It's better to do it now.

You know, the economy is rolling right now. There's lots of money to fix things now, but there will be another war. There will be another depression. There will be economic hard times and this will fall down way down society's list of things to fix and if we don't fix it now and fix it right where the water coming out of this thing is dropping, hopefully we can find out why it's not. I mean I'm just not willing to sign off on anything at this point when it's not doing any better than it's doing.

MR. YOUNG: Let me just say another thing about this volume issue, the volume of leachate. We're not done with that. I'm not suggesting that we

close the books and we're walking about from that. We're going to continue to work on that problem. This record of decision that we're writing here has nothing to do with the volume issue that you're presenting. I agree that is a question that needs to be answered and we're going to do everything that we can to try to find the answers to that question.

The record of decision that I'm talking about presenting here doesn't close the books on that. I'm not saying that we're not going to do anything related to that volume problem. We're going to continue to work on that problem and we're going to continue to find what the answer to that question is.

MS. GORDON: We're not going to sign off on anything that precludes for - - stops us from possibly really fixing the thing or finding out the problem is more expensive than you think it is or whatever. I kind of have the feeling that's what you're doing.

MR. DARWIN: Nestor, a lot of good speakers tonight and what I'm hearing from especially the citizens group or the volume issue, I think it's worth wild to go back and revisit the original assumptions we had when we designed this thing and built it.

We've got a couple of engineered structure over a natural environment and we need to better understand what's going on. Got this big interception trench that's keyed into bedrock. We may be effectively blocking the flow of groundwater which is beneath the way. Not in contact with the way. We may be blocking it and adding that as a volume to what is naturally seeping out at the toe of this landfill. I think that's something we need to look at.

MR. YOUNG: This decision by no way impacts the continuing work that we're doing with the volume issue.

MS. GORDON: What does it do then?

MR. YOUNG: All this decision is is looking at this data that we've collected from these monitoring wells. What I'm asking is: Is this data enough for us to implement some sort of active remediation. I didn't necessarily mention the - -

MS. GORDON: We're not saying that it isn't.

MR. YOUNG: I didn't mention the report that Eric had referred to earlier and that is a Feasability Study. What the Feasabilty Study does is it looks at all of these problems and it looks at various alternatives that would address those

problems.

One of those alternatives that was looked at was an act of pump and treat. Out of all the various - - I think there were four total alternatives that were looked at. The alternative that EPA is selecting for this groundwater issue, these groundwater contaminants is that we want to put in place deed restrictions to eliminate any future exposure to anyone to this contaminated groundwater. When I say contaminated I sort of use that term a little loosely. We're eliminating the exposure. I'm not saying this groundwater is clean to drink and I'm not saying that the groundwater, that these contaminants that we're finding are naturally occurring. I told you up front, I don't have an answer to that question. I don't know if these contaminants are coming from landfill or they're coming from the groundwater. All I'm saying is let's look at the data and decide what we want to do.

The data doesn't necessarily say that this is a major problem that we should be concerned about and we should be pumping the water and cleaning it up. It's right there on that cusp.

What I'm asking you is to consider the groundwater data and let's take a look at that and

decide if we want to do anything related to that groundwater data.

These other issues as far as the volume of leachate and stuff, those are other separate issues that relate to the landfill cap. We continue to work on those issues.

All I'm saying we're cutting to the chase and going to the bottom line. What are we doing to do about those contaminants? Are we going to actively pump and treat or are we going to implement deed restrictions?

MR. WAITMAN: The problem is, Nestor, if you don't get that flaw under control, deed restrictions on what? I mean if it keeps coming, and coming, and coming and the plume starts running down through there, you're going to be buying half of Eastern Daviess County, the development rights to it anyway, and the poor companies are going to be stuck running in circles. You know, it is secondary, but it's the driver. It's got to be what's recharging or filling the plume if there is one. I don't know if there is or isn't, but you may not be able to stop at your fence if we don't really have this thing under control. My goal is to stop at the fence and get out of dodge, you know.

MS. GORDON: These companies are going to have to continue to spend - - if you continue to have a million gallons a year, we understood it was going to get down to a dribble. Are they going to be expected for 100 years, 200 years to pump and treat this thing? That's not reasonable and we all know it. It's not going to go on forever, but the point was the cap was going to work and there was going to be less water every year until it got down really low and dewatered underneath the cap and no new water was coming in. That's not what's happening.

MR. DEXTER: This is Bill Dexter.

It doesn't seem like that it's really just an issue of volume though. It's a question of whether the leachate is impacting the volume.

MR. YOUNG: Correct.

MR. DEXTER: Because the volume can increase or stay at a certain level forever, but if it's not being - - if the leachate isn't impacting that volume, then it doesn't seem to be a problem. In the fact sheet here, there's a comparison to groundwater leachate and it says that the concentrations are less in the leachate than in the groundwater. If that's true, how can the leachate be impact on groundwater?

MR. LIEBENAUER: Actually, it could very easily be impacted in the groundwater. Not necessarily the leachate, but a salt cake fine compile contamination could be having a flow conduit down MW3, down MW10. Compared to leachate to the groundwater doesn't tell us a whole lot necessarily.

MS. LOGSDON: Louise Logsdon.

I'm not very knowledgeable on all this stuff, but if it's not coming from the landfill has the groundwater changed without some reason for it? I mean any kind of chemicals you think could change it?

MR. YOUNG: That's a possibility. That these elements are naturally occurring in the rock. When we sample those wells that we're finding that the rock is contributing to some of those contaminants.

Truth may be somewhere in-between. Truth may be maybe some of it is coming from the landfill and some of it is coming from the rock.

MS. LOGSDON: I know a few years ago everyone in this area had pretty good water, but now we don't. So something has happened. If it's not the landfill - - I mean it wasn't like that before we had the landfill. So that probably make you think it was coming from the landfill or caused from it, you know, because no one up in this area that has very good

water that you can use anymore. You can't do your laundry. You can't drink it. You can't - - well, if you take a bath it gives you skin problems because my husband had that.

MS. PAYNE: See, that's what our concerns who live here. We've drunk this water ten years before it went on to Superfund, you know. Now a lot of us have cattle and everything else around here and livestock. We want, you know -- when you get ready to leave, we want to know this is going to be safe. You know, this is going to be safe for our cattle or kids to play on or whatever. I don't think it is. I think we still have a major problem.

MR. YOUNG: Well, the surface water is clean. We haven't found a problem with the surface water. So cattle drinking it or whatever -- we're not talking about surface water. We're talking about strictly groundwater.

MS. GORDON: The groundwater, year-round stream is fed by groundwater.

MR. YOUNG: Right.

MS. GORDON: Eventually gets in the stream.

MR. YOUNG: We sampled the stream and the stream is fine.

MR. WAITMAN: It wasn't when you got here though. Remember, there were no tadpoles up there? Remember the famous dead raccoon? It wasn't when you started.

MR. YOUNG: Right. We also had contaminated sediment that we removed.

MR. WAITMAN: You know, it's a change.

MS. PAYNE: I guess what they're asking and I'm asking and everybody else is, when you get ready to leave are you going to be able to say, okay, this water is going to be fine. You can drink your well water now? You can use your well water now?

MR. YOUNG: No, because what you're asking me to do is, you're assuming that this landfill has contaminated your water. I don't know that for sure. I can't tell you. I can't go to your property and say that your groundwater is contaminated because of this landfill. I can reasonably assume knowing where your property is that the landfill has not contaminated your groundwater. I can tell you this: There are oil wells in this area that I know has significantly impacted groundwater. I believe that's one of the reasons why your well specifically is closed down.

MR. YOUNG: They're over on the other side going downhill.

MR. YOUNG: Right. But I can't answer your question. I can't tell everybody, yes, your well is free to be used because I don't know the specifics of your situation.

MR. HOWELL: Nestor, five minutes ago you said what do you want me to do? Pump and treat the groundwater or implement deed restrictions? Now, I don't think that you talked at all about the first part of that. Are you proposing to somehow vacuum, suction this groundwater out?

MR. YOUNG: No. What I said that is an alternative that was looked at. That was considered.

MR. HOWELL: It's not a practical alternative.

MR. YOUNG: It's not a practical alternative. That's why we've eliminated it.

MR. HOWELL: So there's the answer to that particular question.

MR. YOUNG: Right.

MR. HOWELL: We were never proposing and apparently you've looked at and have decided it was impractical to try to suck this groundwater out is not - - we agree.

MR. YOUNG: Correct. Correct.

MR. HOWELL: We agree with the deed

restrictions and we think perhaps the deed restrictions need to go further than you've looked at so far.

MR. YOUNG: You mean expanding the deed restriction to adjacent properties?

MR. HOWELL: Beyond the property which you currently control. We won't know that until you've drilled some more test holes.

MR. YOUNG: As far as putting deed restrictions on adjacent properties, I can't speak to that because I'm not an attorney first of all. I have discussed that with my attorney and there are certain legal limitations to that. I don't think that EPA wants to do that. I think question number one is, you know, I don't want to implement deed restrictions on someone elses property unless I know that there's a problem with their property, with their groundwater. So question number one is, what you're telling me is you want an additional well on that property to determine whether or not there are any contaminants in that well, and if there are contaminants you're telling me to put a deed restriction on that property?

MR. HOWELL: Find a way to put a deed restriction on it.

MS. GORDON: You're saying they don't want

to, but I haven't heard you say they can't.

MR. YOUNG: What I said is there are certain legal limitations to that.

MR. HOWELL: You don't have pre-eminent way.

MR. WAITMAN; You can go to the landowner in a kind, nice way and explain the problem to them and purchase those rights. It's not a big deal.

MR. YOUNG: I'm not discounting. I'm not saying either way. I'm just saying I'm not an attorney. I don't know what all the ins and outs are of that. I'm just saying I discussed the issue with my attorney before coming here tonight and there are certain legal limitations to that. I'm not saying it's not doable. I'm just saying there could be a problem.

MS. GORDON: You're not trying to make it sound like it's undoable. I'm saying, no, you're saying you don't want to. You're not saying it's not doable.

MR. YOUNG: Before we even talk about deed restrictions, what Harvey is suggesting is let's find out if there's a problem there.

MS. GORDON: That's what the state is saying.

MR. YOUNG: Certainly you're not suggesting for me to go and put deed restrictions on an adjacent piece of property that we don't even know if there's a problem existing there.

MS. GORDON: You're admitting you don't know if there's a problem existing. We're saying --

MR. YOUNG: I don't have any data to show you that there's no problem on that property, but it's in our opinion reasonable to assume that there isn't a problem there. That's these contaminants are migrating.

MS. GORDON: What we're saying is representing our interest has major serious questions about your monitoring wells it sounds like.

MR. YOUNG: Sure.

MR. WAITMAN: If you don't look, you never will find out if there's any ––

MR. HOWELL: We have evidence and opinions are not always born out.

MR. LIEBENAUER: Nestor, did I hear you say that you would propose downgrade in monitoring wells as a part of operation of maintenance of OU1?

MR. YOUNG: Sure. That could be consideration.

MR. LIEBENAUER: How do you relate that

because I thought OU1 is - - right now OU2 discuss about the groundwater issue.

MR. YOUNG: Well, we're talking about operation and maintenance of the landfill. We're not talking about a remedy.

MR. LIEBENAUER: And that has not been approved yet?

MR. YOUNG: Actually the plan has not been approved yet.

MR. DEXTER: It's being implemented.

MR. YOUNG: They're operating and maintaining the landfill, but the actual plan hasn't actually been officially approved and this can be an element of that plan. The operation maintenance of the landfill has nothing to do with the actual remedy. The remedy has been implemented.

MR. LIEBENAUER: I understand.

MR. YOUNG: So what we're talking about is using monitoring wells to effectively evaluate the remedy that was implemented. That's all I'm saying.

MR. LIEBENAUER: Which really ties down to OU2 concern and the issue that you're talking about.

MR. YOUNG: Yes. That's what I'm saying. If we're going to talk about whether these contaminants are getting out, we can talk about that

in terms of the effectiveness of the landfill cap and the operation and maintenance of that cap.

The issue that I'm putting here on the table is the contaminants that we're finding in the wells. Do we do anything about those contaminants?

What I'm saying is I'm acknowledging the fact that we're finding some contaminants in these wells. The contaminants are posing a risk to human health based on exposure. The remedy that we're proposing is to let's eliminate that exposure by implementing deed restrictions. So the contaminants that we're looking at in these monitoring wells will not pose a risk to human health if we eliminate that exposure. Now, we can talk about the volume in landfill, you know, volume of water in landfill. We can talk about maybe contaminants escaping the property boundary or whatever, but we can talk about those things in terms of the operation and maintenance and the effectiveness of the landfill cap is what I'm saying.

Let's wrap this thing up. We've kind of been here for two hours already. I'm sure you're all very tired and information overload.

Like Diane said we have a 30 day comment period where we're soliciting your comments. EPA will

consider all the comments that were collected today and in the 30 day comment period and decide on a remedy.

Let me point you to a couple of resource materials. First of all the fact sheet that everybody got in the mail. This fact sheet presents some of the information that we collected and presents the proposed remedy that we have talked about here tonight.

The other piece of information is this groundwater sampling report which describes in detail the analysis that was conducted on those monitoring wells. This report is in the repository at the Owensboro Library.

The other piece of information that is going to be used in making this decision is the Focus Feasability Study that I mentioned earlier. This report is also at the Owensboro Library.

I would encourage you to go by the library, take a look at these reports, look at the information I've presented, read about it in more detail and provide EPA with some comments.

The fact sheet has an address where you can mail in the comments. We actually have a page in this fact sheet where you can write, handwrite your

comments in here and just mail it to us or if you'd like send us a letter. The address where we can be reached is in this fact sheet.

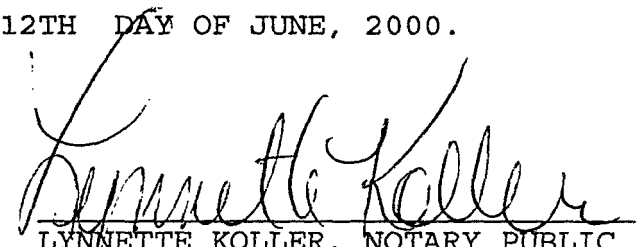
With that I'd like to thank you all for coming tonight and if you have any questions like Diane mentioned there's a 1-800 number where I can be reached. If you have any questions after tonight, you can certainly give me a call and I'll be glad to answer your questions.

Thanks for coming.

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF DAVIESS)

I, Lynnette Koller, Notary Public, State-at-Large, do hereby certify, that the aforegoing EPA Public Meeting was taken by me at the said time, place, and for said purposes as stated in the caption; that the Public Meeting was reported by me in stenotype and electronically recorded and aforegoing is a true, correct, and complete transcript thereof.

DATED THIS 12TH DAY OF JUNE, 2000.



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COMMISSION EXPIRES:
DECEMBER 19, 2002

COUNTY OF RESIDENCE:
DAVIESS COUNTY, KENTUCKY

Comments for 18 May 2000 EPA meeting Re Green River superfund site.

My name is Richard Waitsman A group of us have been monitoring the clean up of this site and talking with the EPA and the Kentucky Waste Management folks for many years.

Now is not a good time for this decision. This site has always been primarily a groundwater contamination problem. The premise of the clean up was, the bad materials were to be located in the dump area of the landfill, covered with a cap of waterproof materials to prevent new water from getting into them, the contaminated water (leachate) in the dump would be pumped out at the bottom of the dump and filtered clean. Over time the dump would dry out and since no new water was going through, it would not put out contaminated water to pose a risk to the community. We say it is sort of like pouring water through bad coffee grounds. If you put a clay cup over the grounds, stop the water from getting in and clean up the water in the cup the problem is solved.

If this had happened this proposal might be reasonable. This has not happened. The cap has been on several years and the flow of leachate (the bad coffee) is about as great as ever. This was with last year being one of the driest years on record. The fact that waters is coming out as strongly as ever means we do not have a cup that is water proof around the dump material. This means the expense and risks of running pumps to treat this volume of leachate is infinite. Our companies should not bear this treatment expense indefinitely and we should not be at risk of the escape of contaminated leachate indefinitely. It also suggests we do not understand the water flow as well as we thought we did. If we do not know where water is coming in from we may not know all the places is going out. The leachate data and the presence of metals in the monitoring well cluster MW-3 / MW -10 shows contaminated water is getting out of the landfill.

No permanent decisions should be made till we get the flow of water through the site under control and dry out the material under the cap as evidenced by progressively cutting down leachate flow.

The study argues that various metals are found in the soil here naturally and this explains why the metals are in the water samples. Yet at the same time, the study says that the metals do not enter the water and travel about. It is not clear that there is an up stream monitoring well that proves these metals occur in our ground water naturally. It is also not clear what effect the presence of the ammonia produced by the salt cake coming in contact with water might have on the leaching of metals or their ability to move in the ground water.

The proposal for clean up, involving drying out the landfill, that would lead us to this step has not happened. No permanent decision is warranted until we can demonstrate we understand the water flow on the site. We agree with the comments of the Kentucky Waste Management folks.

Thank you for your attention.